PAPER TRADE JOURNAL
Title Reg. U. S. Pat. Off.

Vol. 115, No. 15 Thursday, October 8, 1942 Price Ten Cents

Test Waste Liquor Plant Will Now Be Built

WPB Rescinds Former Order and Grants Permission to Manufacturers Committee To Erect Semi-Commercial Experimental Plant At Appleton — Outlines Growth of Paper Institute — Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., October 5, 1942—Rescinding a former order, the War Production Board has granted permission to the Wisconsin Sulphite Manufacturers Committee on Waste Disposal to erect a semi-commercial experimental plant at Appleton, according to announcement of J. M. Holderby, director of the project.

The plant, estimated to cost about $15,000, will be built on the Fox River adjacent to the sulphite mill of the Interlake Pulp and Paper Company division of the Consolidated Water Power and Paper Company.

Processes developed by the research staff of the Institute of Paper Chemistry, cooperating with the committee, will be tried out in the new plant. The aim is to find a profitable method of disposing of waste sulphite liquor from Wisconsin mills in order to comply with the wishes of the Wisconsin State Board of Health to end stream pollution.

WPB turned down the first application for construction of the plant on the premise that it would require strategic war materials. The new order carries no priority ratings or preference of any kind, because the mills offered to sacrifice some of their own materials in order to build the plant. Maintenance stocks will be used for the construction.

In a recent address before the Lions Club at Appleton, Mr. Holderby explained the situation of the mills with respect to waste disposal. He said the municipal sewage treatment plants were not adequate to handle this waste, the total of which equals the entire discharge from a large city. He said, on the basis of the cost of disposal plants constructed, the mills would have to spend over $40,000,000 to build similar plants, and it would mean some of them would have to go out of business.

The mills therefore have attempted to work out processes that would have commercial value for the products recovered, in order to alleviate the tremendous cost otherwise necessary. The exact methods to be used have not been revealed, but the conclusions thus far reached by the researchers are encouraging.

Thilmany Opens Safety Campaign

Beginning October 1, the Lakeview mill of Kimberly-Clark Corporation, Neenah, Wis., will conduct a three months' safety campaign to conserve manpower by reducing accidents and the number of sickness cases. The slogan is, "This is no time for lost time."

Committees have been named for the 21 mill units, each of which will determine its own program to eliminate hazards and unsafe practices peculiar to the unit. An award will go to the unit that conserves the most time compared to its record of the first nine months of the year. On-duty and off-duty accidents will be considered of equal importance.

Outlines Progress of Paper Institute

Progress made by the Institute of Paper Chemistry, Appleton, Wis., was outlined by Westbrook Steele, executive director, in an address September 30 before the Rotary Club at Menasha, Wis. Since its establishment in 1929 with a budget of $4,000 and a staff of three, the Institute has grown to the point where the 1941 budget was $432,000, there are 166 instructors on the staff, and the worth of the buildings, fully paid for, is $1,750,000. The faculty ratio is perhaps the highest of any institution, with one instructor to each 1.5 students. Only about one out of 20 students who apply is accepted, and only 15 are enrolled each year for the four-year graduate course. All admissions are made on scholarships and no student has ever paid his own tuition.

In 12 years, the Institute has turned out 64 Ph. D. degrees, and its graduates are in great demand. Students have no vacation period, but work in mills gaining practical experience during holiday times. The entire teaching staff has at some time or other worked in the industry, giving it a practical rather than a theoretical background, Mr. Steele said.

The library, one of the largest technical collections in the world, uses seven languages and has its own technical editor, the speaker declared. It is the only unit privately endowed. Operating costs are paid

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Demand Continues To Improve in Chicago

Sales of Many Grades of Paper Reported To Reflect More Activity — Box Board and Waste Paper Slow — OPA Plans Meeting Next Week—ODT Requirements Considered Severe—Other News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., October 5, 1942—The Chicago paper market is once again "up in the air" over news from Washington that the industry is being studied by the War Production Board with the possibility that some method of use-limitation be developed to take care of consumption by major paper users. Despite this newest of "merry-go-grounds," local paper trade circles report a continued improvement in demand with krafts and book papers giving more and more evidence of buyer interest. Sulphites were also much more active according to local reports while groundwoods and newsprints reflected the general change in sentiment. It was felt locally that continued publicity on use-limitation or production curtailment possibilities would cause even more buyers to get into the market. Specialty papers showed marked evidence of a good advance holiday buying. Box board continued to be over-sold because of earlier curtailment program developed by those who would otherwise be buyers. Waste papers were little changed during the week.

Plan OPA Meeting Here

The paper section of the Office of Price Administration is to hold a meeting at the Morrison Hotel, Chicago, on October 16 according to OPA headquarters at 20 N. Wacker Drive. It was reported that paper section executives from Washington would be on hand to review the current price situation. In some quarters it was felt that this would be the time when the mid-western paper industry would hear a great deal more about the curtailment program. Washington discussions reveal tentative proposals running all the way from manufacturing curtailment to limiting consumption by major users and paper merchants and anufacturers are reported to be closely studying what adjustents they can make to contribute further to the war effort. Further details on the Chicago meeting was not obtainable from local OPA offices.

Succeeds Frank Borchers

O. S. Barrie has succeeded Frank Borchers, deceased, as western sales manager of the Oxford Paper Company. Mr. Barrie will also handle the sales of the Oxford Miami Paper Company with headquarters at 35 East Wacker Drive.

Pioneer Executive Adds to Duties

John Middleton, Pioneer Paper Stock Company executive and its traffic manager since 1929, has been given the added duties of acting as purchasing agent. Mr. Middleton has been with the Pioneer organization for over twenty years.

Paper Men To Attend Traffic Meeting

Traffic and transportation experts of the paper trade are expected to attend a meeting this week at which F. C. Horner, chief of highway transport of the War Department, speaks on the rubber situation and other current "vital problems" concerning the motor freight industry. Mr. Horner will speak before motor truck operators, shippers and traffic men at the Hotel Morrison on October 7.

ODT Requirements Termed "Stiff"

Paper jobbers who have had an opportunity to review the requirement necessary for obtaining operating certificates for trucks under ODT 21 have characterized the requirements "as the most stringent they have yet seen." In addition to tire data operators will be required to submit information on types of business, area of operation, territory of over-the-road operations, number of vehicles owned and leased or rented, complete data on past operations and future operations by quarters, miles operated quarterly by vehicles owned and leased, average load per trip in terms of tons, cubic feet or other units, average load in terms of percentage of capacity of vehicles and much other information. Records of operation, subject to ODT inspection, must be kept by all operators affected by the order which becomes effective November 15.

Perry R. Cassidy Now Lt. Colonel

Perry R. Cassidy, former executive assistant, the Babcock & Wilcox Company is now Lt. Colonel in the Engineer Corps, U. S. Army. He was a Captain in the Coast Artillery in World War I, his last assignment being at the School for Antiaircraft Officers at Fort Monroe. He began his service with Babcock & Wilcox in 1916 and was appointed a vice president of Fuller Lehigh Company in 1928. Upon the consolidation of Fuller Lehigh with Babcock & Wilcox he was made an executive assistant of the latter company, holding that position until entering the Service. He is a member of the Boiler Code Committee of the American Society of Mechanical Engineers, the American Welding Society, American Society for Testing Materials, American Society for Metals and the author of a number of technical papers. He was also a member of the Technical Advisory Committee on Alloy Steel Plate of the W.P.B.

Northwest Superintendents To Meet

The Northwest Division of the American Pulp and Paper Mill Superintendents Association, J. B. Roskams, secretary, Green Bay, Wis., will hold a one-day fall meeting at the Hotel Wausau, Wausau, Wis., on October 17, 1942.

The program, R. J. Kennedy, Rhinelander Paper Company, leader, will open at 10 A.M., with a round table discussion of mill problems. It will discuss what is new in substitutes, and what is being done to keep the mill in operation.

The afternoon program will include bowling at the Elks Club, with dinner at the Hotel Wausau.

The ladies program will include a mid-day luncheon and bridge at the Wausau Club, with a joint dinner at the Hotel Wausau.

Doubt Shortage of Newsprint in the Future

Informed Sources In Toronto Foresee No Serious Threat To Adequate Supply of Newsprint—Power Supply Is Unknown Factor In Future—Manpower Situation Becoming Acute—Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., Oct. 5, 1942 — Notwithstanding persistent reports to the contrary, well informed sources here doubt that there is any great danger of a shortage in newsprint in the near future. Advices from Montreal contend that a shortage in the Canadian newsprint supply is now a definite possibility.

It is pointed out here that while there has been a moderate curtailment of operations due to a power shortage, the present rate of production will take care of any likely demand. It is admitted that there is a possibility that demand may run a little ahead of supply during the last two months of this year, but this condition is not in evidence as far as October is concerned.

If present operating figures are exceeded by demands, it can be shown that stocks of newsprint in the hands of American producers and publishers are unusually heavy. The total tonnage on hand is said to be 917,465 tons, or about 200,000 tons more than was held in reserve a year ago and the largest reported since February, 1938. The publishers' reserve amounts to more than two months' supply, at the rate of consumption given for August, or almost double the normal reserve.

Even with the staggered hours plan now in operation in Quebec, affecting chiefly those newsprint plants taking their electrical power from the Shawinigan Water and Power Company or its subsidiary, Quebec Power, the mills are still permitted to work six days a week. For instance, Canadian International Paper at Three Rivers, takes Sunday off and works the other six days, while St. Lawrence Paper Mills in the same city shuts down on Monday only. The other companies in the area each have their day of rest in like manner.

Future Power Requirements Unknown

Emphasis has been shifted from anticipated transportation difficulties to production problems, however, since no one, not even Power Controller H. J. Symington, is able to tell exactly what the power situation is likely to be very far into the future.

Whether or not there will be any further curtailment of electrical power or diversion of power from the newsprint industry seems to depend upon the result of a race between workmen building new aluminum plants and those building new power development facilities. The great Shipshaw electrical development seems likely to be at least partially available a little earlier than was expected. No power was expected from that source before mid-winter, but it now seems likely that at least one unit will be in operation by the end of December. Besides this huge development project extensions to plant capacity are being made on the St. Maurice River and at Beauharnois. Immediate use for all this new power will be found, however, by the additional pot rooms in the new aluminum developments. Each new pot consumes enormous amounts of electrical power. If the pots are ready before the electricity is available, more power will have to be diverted from the newsprint industry because of the urgency for aluminum for the war. If the power development keeps pace with the aluminum industry, the situation should remain in a comparatively satisfactory state of balance.

Using Wood Pulp for Explosives

Canadian wood pulp is being used as a source of cellulose instead of imported cotton linters, for use in the manufacture of nitrocellulose explosives, to the extent that Canada will save several millions of dollars a year, according to the "C.I.L. Oval," a house organ of Canadian Industries, Ltd.

Wood cellulose has been used in Canada for a good many years in the manufacture of cellophane and rayon, but it is only since the beginning of the war that any move has been made to adapt wood pulp to the manufacture of nitrocellulose.

One Canadian wartime explosives plant has been operating on wood pulp for over a year. Two others have been using this domestic type of cellulose exclusively now for months. The use of cellulose-bearing wood pulps, has eliminated the importation of cotton linters from the United States for making explosives, and also has effected a considerable saving in foreign exchange and lowered the raw material cost without in any way impairing the quality of the resultant product.

Manpower Problem Becoming Acute

With hundreds of men being shifted from gold mining to mines producing base metals and more hundreds being recruited from the farms and other seasonal occupations into the lumbering industry, the pulp industry is experiencing a decided squeeze. While many older men have been and still are employed at this work, it is only those who have been used to the rigors of the bush who can withstand the hardships and the supply of such men in the lumbering settlements and surrounding farms has been exhausted. Unlike so many other industries, the pulp and paper industry cannot resort to the employment of women.

Hinde & Dauch are Active

According to L. F. Winchell, vice-president and general manager of Hinde and Dauch Paper Company of Canada, mill production continued at capacity and box factory operations were the same as in the first six months of the year. Except for the usual year-end decline, it is anticipated that current demand will continue pretty well through the last quarter.

Mr. Winchell says in his letter to shareholders, however, that because of expected manpower and electric power shortages it now looks as if the industries with which the company is affiliated are likely to be more extensively restricted. It is possible that there may be some concentration of production resulting in part-time or shutdowns for some plants. Practically 90% of the principal raw materials the company uses are salvaged materials—especially important under wartime economy, Mr. Winchell states, while a majority of the end uses of the company's products are essential to the war or to the maintenance of a minimized civilian standard of living.

Bids for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 7, 1942—The Government Printing Office has received the following bids for 20,400 pounds of 28 x 34 buff sulphite writing paper: (bids per pound) Whiting-Patterson Company, Inc., 8 cents; D. L. Ward, 7.12 cents; Coy Hunt and Company, 7.15 cents; Bulkley, Dunton and Company, 6.35 cents; North American Pulp and Paper Corp., 6.9 cents; Bradner Smith & Co., 6.43 cents; Wilcox-Walter-Furlong Paper Company, 6.49 cents; Whitaker Paper Company, 6.75 cents; Walker-Goulard-Plehn Company, Inc., 6.35 cents; Stanford Paper Company, 6.75 cents; Resolute Paper Products Corporation, 6 cents; Frank Parsons Paper Company, 7.15 cents; Paper Corporation of U. S., 6.07 cents; the Old Dominion Paper Company, 6.0839 cents; Marquette Paper Company, 6.12 cents; Eastern Corporation, 6.104 cents; Central Ohio Paper Company, 6.39 cents; Cauthorne Paper Company, 6.8 cents; Barton, Duer and Koch Paper Company, 6.83 cents; R. P. Andrews Paper Company, 6.83 cents; and the Aetna Paper Company, 6.64 cents.

For 71,750 pounds of 32 x 42 yellow sulphite writing paper, bids per pound received were: Whiting-Patterson Company, Inc., 8 cents; D. L. Ward Company, 7.12 cents; Coy Hunt and Company, 7.15 cents; Bulkley, Dunton and Company, 6.35 cents; North American Pulp and Paper Corporation, 6.9 cents; Bradner Smith & Co., 6.43 cents; Wilcox-Walter-Furlong Paper Company, 6.73 cents; Whitaker Paper Company, 6.75 cents; Walker-Goulard-Plehn Company, Inc., 6.35 cents; Stanford Paper Company, 6.75 cents; Resolute Paper Products Corporation, 6 cents; Frank Parsons Paper Company, 7.15 cents; Paper Corporation of U. S., 6.07 cents; the Old Dominion Paper Company, 6.0839 cents; Marquette Paper Company, 6.12 cents; Eastern Corporation, 6.104 cents; Central Ohio Paper Company, 6.39 cents; Cauthorne Paper Company, Inc., 8.8 cents; Baxter Paper Company, 6.93 cents; Barton, Duer & Koch Paper Company, 6.83 cents; R. P. Andrews Paper Company, 6.83 cents; and the Aetna Paper Company, 6.64 cents.

For 71,750 pounds of pink, 32 x 42 sulphite writing paper: Whiting-Patterson Company, Inc., 8 cents (per pound); D. L. Ward Company, 7.12 cents; Coy Hunt & Co., 7.15 cents; Bulkley, Dunton and Company, 6.35 cents; North American Pulp & Paper Corporation, 6.9 cents; Bradner Smith & Co., 6.43 cents; Wilcox-Walter-Furlong Paper Company, 6.32 cents; Whitaker Paper Company, 6.75 cents; Walker-Goulard-Plehn Company, Inc., 6.35 cents; Stanford Paper Company, 6.75 cents; Resolute Paper Products Corporation, 6 cents; Frank Parsons Paper Company, 7.15 cents; Paper Corporation of U. S., 6.07 cents; the Old Dominion Paper Company, 6.0839 cents; Marquette Paper Company, 6.12 cents; Eastern Corporation, 6.104 cents; Central Ohio Paper Company, 6.39 cents; Cauthorne Paper Company, 6.8 cents; Baxter Paper Company, 6.93 cents; Barton, Duer and Koch Paper Company, 6.83 cents; R. P. Andrews Paper Company, 6.83 cents; and the Aetna Paper Company, 6.64 cents.

For 435,800 pounds of 20½ x 31½ white sulphite writing paper, bids per pound received were: R. P. Andrews Paper Company, 5.72 cents; Frank Parsons Paper Company, 6.5 cents; D. L. Ward Company, 6.58 cents; Marquette Paper Company, 5.97 cents; Cauthorne Paper Company, 6.18 cents; Walker-Goulard-Plehn Company, Inc., 6.2 cents; Eastern Corporation, 5.66 cents; Whitaker Paper Company, 5.17 cents; Mudge Paper Company, 5.9 cents; Barton, Duer & Koch Paper Company, 5.72 cents; Butler Paper Company, 6.13 cents; Central Ohio Paper Company, 6.13 cents; Wilcox-Walter-Furlong Paper Company, 5.49 cents; Bradner Smith & Co., 5.93 cents; Bulkley, Dunton & Co., 6.2 cents; Coy Hunt & Co., 6.5 cents; North American Pulp and Paper Corporation, 6.5 cents; Stanford Paper Company, 6.25 cents; and Bermingham and Prosser Company, 6.102 cents.

For 45,100 pounds of 50% rag, 34½ x 44 buff index paper, bids per pound received were: R. P. Andrews Paper Company, 11.43 cents; Barton, Duer & Koch Paper Company, 10.53 cents; Cauthorne Paper Company, Inc., 12.25 cents; Central Ohio Paper Company, 13.5 cents; Mudge Paper Company, 12.89 cents; Old Dominion Paper Company, 16.329 cents; Paper Corporation of U.S., 11 cents; Resolute Paper Products Corporation, 16.5 cents; Stanford Paper Company, 13 cents; Walker-Goulard-Plehn Company, 11.19 cents; Whitaker Paper Company, 11.37 cents; Wilcox-Walter-Furlong Paper Company, 16.36 cents; Bradner Smith & Co., 13.26 cents; Bulkley, Dunton & Co., 13.5 cents; Carpenter Paper Company, 13.5 cents; Coy Hunt & Co., 10.824 cents; and D. L. Ward Company, 13.5 cents.

For 2,000,000 pounds of Chemical Wood Manila Paper, size of rolls in multiples of 11½, bids per pound received were: D. L. Ward Company, 5.69 cents; St. Regis Paper Company, 5.7 cents; Bermingham & Prosser Company, 4.15 cents; Bulkley, Dunton & Co., 5.9 cents; Bradner Smith & Company, 4.1499 cents; Wilcox - Walter - Furlong Company, 4.125 cents; the Whitaker Paper Company, 4.64 cents; Walker-Goulard-Plehn Company, Inc., 5.68 cents; Virginia Paper Company, 4.25 cents; Stanford Paper Company, 4.23 cents; Frank Parsons Paper Company, 5 cents; Paper Corporation of U.S., 5.5 cents; the Old Dominion Paper Company, 4.222 cents; The Mudge Paper Company, 5.7 cents; Marquette Paper Company, 5.93 cents; Graham Paper Company, 5.58 cents; The Central Ohio Paper Company, 4.1947 cents; Cauthorne Paper Company, 6.4 cents; The Barton, Duer & Koch Paper Company, 4.16 cents; R. P. Andrews Paper Company, 4.77 cents.

For 46,800 pounds of 25% rag buff ledger paper, 24 x 38, bids per pound received were: Baldwin Paper Company, Inc., 10.35 cents; Whiting Paper Company, 14.25 cents; Collins Manufacturing Company, 10.69 cents; Bulkley, Dunton & Co., 11.39 cents; Wilcox-Walter-Furlong Paper Company, 11.95 cents; Walker-Goulard-Plehn Company, Inc., 11.49 cents; Stanford Paper Company, 11.10 cents; Resolute Paper Company, 12.3 cents; Paper Corporation of U.S., 10.55 cents; the Old Dominion Paper Company, 11.988 cents; The Mudge Paper Company, 10.42 cents; the Central Ohio Paper Company, 11.39 cents; Cauthorne Paper Company, Inc., 12.72 cents; The Barton, Duer & Koch Paper Company, 10.77

cents; R. P. Andrews Paper Company, 12.72 cents; and the Aetna Paper Company, 12.08 cents.

For 1,000 pounds of red stereotype molding paper, 24 inches wide, 19 x 24, bid per pound received was 14.5 cents by the Cauthorne Paper Company.

For 57,400 pounds of green sulphite writing paper, 32 x 42, No. 40, bids per pound received were: Aetna Paper Company, 6.11 cents; R. P. Andrews Paper Company, 6.83 cents; Barton, Duer & Koch Paper Company, 6.83 cents; Baxter Paper Company, 6.93 cents; Butler Company, 7.02 cents; the Central Ohio Paper Company, 6.76 cents; Eastern Corporation, 6.04 cents; Graham Paper Company, 7.05 cents; Marquette Paper Company, 6.74 cents; Mudge Paper Company, 6.73 cents; The Old Dominion Paper Company, 6.74 cents; Paper Corporation of U.S., 5.97 cents; Resolute Paper Products Corporation, 6 cents; Stanford Paper Company, 6.83 cents; Walker-Goulard-Plehn Company, Inc., 6.4 cents; The Whitaker Paper Company, 7.34 cents; Wilcox-Walter-Furlong Paper Company, 5.99 cents; Bradner Smith & Co., 6.43 cents; North American Pulp & Paper Corporation, 6.5 cents; Bulkley, Dunton & Co., 7.44 cents; Mead Sales Company, 7.42 cents; Bermingham & Prosser Company, 7.2 cents; Coy Hunt & Co., 6.09 cents; St. Regis Paper Company, 6.75 cents; D. L. Ward Company, 7.12 cents.

For 480,000 pounds of white sulphite writing paper, 32 x 42 No. 40, bids per pound received were: R. P. Andrews Paper Company, 5.72 cents; The Barton, Duer & Koch Paper Company, 5.72 cents; the Baxter Paper Company, 6.18 cents; The Central Ohio Paper Company, 6.27 cents; Eastern Corporation, 5.64 cents; Graham Paper Company, 6.47 cents; Marquette Paper Company, 6.21 cents; the Mudge Paper Company, 6.43 cents; the Old Dominion Paper Company, 6.74 cents; Paper Corporation of U.S., 5.67 cents; Stanford Paper Company, 5.72 cents; Walker-Goulard-Plehn Company, Inc., 5.37 cents; Whitaker Paper Company, 5.72 cents; Wilcox-Walter-Furlong Paper Company, 5.34 cents; Bradner Smith & Co., 5.93 cents; North American Pulp and Paper Company, 6.25 cents; Bulkley, Dunton & Co., 5.94 cents; The Mead Sales Company, 6.69 cents; Bermingham & Prosser Company, 6.243 cents; St. Regis Paper Company, 6.75 cents; D. L. Ward Company, 6.58 cents.

For 300,000 pounds of supercalendered book paper, 38 inch rolls, 25 x 38, bids per pound received were: R. P. Andrews Paper Company, 5.168 cents; Butler Company, 6.279 cents; The Central Ohio Paper Company, 5.48 cents; Graham Paper Company, 6.43 cents; Mudge Paper Company, 5.58 cents; Paper Corporation of U.S., 5.82 cents; Frank Parsons Paper Company, 5.44 cents; Perkins-Goodwin Company, 5.42 cents; Stanford Paper Company, 6.4 cents; Walker-Goulard-Plehn Company, Inc., 6.43 cents; Bulkley, Dunton & Co., 6.43 cents; The Mead Sales Company, 5.55 cents; and Bermingham & Prosser Company, 6.33 cents.

Oilless bronze bearings are described in Catalogue No. 5 issued by the R. W. Rhoades Metaline Co., 50-17 Long Island City, N. Y. It explains the company's Metaline bearings, how they function and their application for light and heavy loads, such as clutch bearings, felt roll bearings, dryer rolls, gears on batter washers and stock chests. A table of dimensions is included.

TO BUILD WASTE LIQUOR PLANT

(Continued from page 7)

by member mills on a tonnage production basis. The library has 238 scientific publications to its credit, together with 135 patents, and has carried out more than 1,000 projects for the benefit of paper mills and other industries permitted to use its research facilities.

Devoted now to the war effort, the Institute has been of material aid to the country, Mr. Steele concluded, without cost to the government. Since 1939, the institution has been closed to visitors. Prior to that time it attracted 3,000 per year.

Assures More Power For Paper Mills

Augmented power supply for paper mills of the lower Fox River Valley is now assured through the completion of a generator installation at the new municipal utility plant at Kaukauna, Wis. The 3,000 K.V.A. generator was placed in operation last week, and will develop 2,400 kilowatts. The installation was made at a cost of $180,000.

The new plant now has two 2,400-kilowatt units, the first of which was placed in operation in December, 1941. The utility has four plants from which it is producing current for mill and domestic use, and has installed automatic load controls to keep the power flow uniform and constant according to demand.

Appleton Wire Works Builds Addition

Appleton Wire Works, Appleton, Wis., is constructing an addition 45 by 96 feet and 12 feet high to its plant. The cost is estimated at $4,900, and the contract has been awarded to the Hoffman Construction Company of Appleton. The unit will be used for expanded operations.

Thilmany Salvages Much Scrap Metal

Thilmany Pulp and Paper Company, Kaukauna, Wis., has demonstrated its war cooperation by disposing of 540,123 pounds of scrap metal from January 1 to September 30, according to L. C. Smith, personnel director. The salvage program is headed by Albert Klammer. Scrap consisted of cast iron, steel, electric wire, brass castings, tin, borings, zinc and aluminum. Every department was searched and all equipment which could not be used in the immediate future was junked. The program will be continued, and by January 1 the company expects to contribute 200,000 pounds more.

Northeast Chemists Hold Meeting

More than 100 attended the first fall meeting of the Northeast Wisconsin section of the American Chemical Society October 1 at Lawrence College, Appleton, Wis. The speaker was Dr. J. Alden Murray of the Plaskon Company, Toledo, Ohio. His subject was "The Use of Urea-Formaldehyde in Plastics and Paper." Prior to the meeting a dinner was held in honor of the speaker at the Candle Glow Tearoom.

N. E. Paper Association Moves

BOSTON, Mass., October 5, 1942—The offices of the New England Paper Merchants Association, formerly at 10 Post Office Square, are now at 80 Federal street, Chamber of Commerce Building, Rooms 611-612.

In Quest of Old Keys for Uncle Sam

Robert Seybold, Cincinnati Chairman of the National Key Kollection Kampaign sponsored by the Paper and Twine Club of America, started his nephew, Harvey Seybold, Jr., on his way through Cincinnati streets last week—a horse-and-surrey way—in the interest of further success in the accumulation of tons of keys for the nation's scrap pile.

Harvey, 15 years old, had special permission from L. P. Stewart, principal of Walnut Hills High

HARVEY SEYBOLD JR., ON COLLECTION TOUR

School, to absent himself from his studies for the day. In the next two weeks the youth plans to put in after-school time and the week-end holidays driving Billy, his own horse, and the family surrey about town, emptying the contents of the collection cans at scores of shops into the big barrel on the surrey. During school hours Billy will rest and feed at the Seybold farm, Fair Acres, in Amberley Village.

Puget Sound Co. Honors Late President

At a special meeting of the board of directors of the Puget Sound Pulp and Timber Company, held September 26, tribute was paid to Ossian Anderson, late president of the company, in the following resolution:

"Whereas, in the death of Ossian Anderson the company has lost its esteemed president and the Pacific Northwest has lost one of its foremost citizens, a man of keen and farseeing intellect, a builder of constructive force and a counsellor of great wisdom,

"Now, therefore, be it resolved, that the board of directors of the Puget Sound Pulp and Timber Company shall and it hereby does note in its records its tribute to the life and worth of Ossian Anderson, and its appreciation of his noble character and the eminent services he had rendered to his country and to humanity; and

"Be it further resolved, that a copy of this resolution be tendered to his bereaved family."

Replacing the late Ossian Anderson as president, the board elected Fred G. Stevenot of San Francisco. Mr. Stevenot has been a director of the pulp company since 1937, and is chairman of the board of the company's subsidiaries, Canadian Forest Products, Ltd., and Beaver Cove Timber Company, Ltd. He was formerly Director of Forestry of the State of California, member of the California Railroad Commission, and vice-president, Bank of America; and at present is a director of several California companies.

Lawson Turcotte, associated with the Puget Sound Pulp and Timber Company since 1926, and Secretary-Treasurer since 1934, was elected a director and executive vice-president. Walter DeLong, operating manager since 1929, was elected vice-president.

Sulphite Liquor as a Road Builder

MONTREAL, Que., October 5, 1942—The Province of Quebec has found a commercial use for the waste sulphite liquor from chemical pulp mills. It is now bringing this liquor into use as a binder for the surfacing of highways. This development is the result of restrictions placed upon the use of asphalt, the constituents of which are now required for war work.

The Hon. C. D. Bouchard, Minister of Roads for the Province, has been working on this subject for some time past with Ernest Gohier, chief engineer of the Roads Department, J. B. Garneau, chief of the department laboratory, and Guillaume Piette, engineer in charge of the study of soils, who spent two years at the University of Michigan, where he specialized in the study of sulphite liquid as a road binder.

The department is now laying a surface of this stabilized gravel—which is what the composition formed by the liquid sulphite is called—on the St. Esprit-St. Donat highway over a distance of 18 miles, the methods learned in the laboratory being employed on the whole stretch. The composition is made up of 90 per cent gravel, about 9 per cent of argile and one per cent of the sulphite liquid. The experts say that the use of this composition will mean that even if the department has to do without asphalt in the future it will be possible to build roads of this stabilized gravel which will be dustless, with a hard surface though easy on vehicles and as comforting generally for traffic as a bituminious concrete or a cement-concrete road.

Chain Belt Army-Navy E

On September 19 amid a colorful setting of many flags and in the presence of over 4,000 employees and their families the presentation of the award of Army and Navy E was made to the Chain Belt Company of Milwaukee, Wis. J. C. Merwin, president of the company, in an address of welcome read a letter from Winston Churchill written after the first World War, expressing the appreciation of the British government for the cooperation the Chain Belt Company gave them toward winning that war. His words were somewhat similar to those of Robert Patterson. He said, "I desire personally to thank you and your staff for the help which you have rendered, and to express my appreciation of the fact that the enthusiasm and interest which was exercised was something more than ordinary commercial considerations could demand."

Chain Belt Company last year celebrated its fiftieth anniversary. It is one of the largest manufacturers of chain belts and power transmission machinery, conveyors of all types, sanitation equipment and construction machery. Quite recently, the operations of the company were expanded to include those of the Baldwin-Duckworth Chain Corporation of Springfield and Worcester, Mass.

Deduction of Advertising Expenses

The Bureau of Internal Revenue has just released the following statement by Commissioner Guy T. Helvering on the "Deduction of Advertising Expenses for Tax Purposes":—

"To be deductible, advertising expenditures must be ordinary and necessary and bear a reasonable relation to the business activities in which the enterprise is engaged. The Bureau recognizes that advertising is a necessary and legitimate business expense so long as it is not carried to an unreasonable extent or does not become an attempt to avoid proper tax payments.

"The Bureau realizes that it may be necessary for taxpayers now engaged in war production to maintain, through advertising, their trade names and the knowledge of the qualify of their products and good will built up over past years, so that when they return to peace-time production their names and the quality of their products will be known to the public.

"In determining whether such expenditures are allowable cognizance will be taken of (1) the size of the business, (2) the amount of prior advertising budgets, (3) the public patronage reasonably to be expected in the future, (4) the increased cost of the elements entering into the total of advertising expenditures, (5) the introduction of new products and added lines, and (6) buying habits necessitated by war restrictions by priorities, and by the unavailability of many of the raw materials formerly fabricated into the advertised products.

"Reasonable expenses incurred by companies in advertising and advertising technique to speed the war efforts among their own employees, and to cut down accidents and unnecessary absences and inefficiency, will be allowed as deductions. Also reasonable expenditures for advertisements including the promotion of Government objectives in wartime, such as conservation, salvage or the sale of War Bonds, which are signed by the advertiser, will be deductible provided they are reasonable and are not made in an attempt to avoid proper taxation.

"It is the statutory responsibility of the Bureau to determine and collect Federal taxes, among which are the income and excess profits taxes, and to prevent abuses and attempts to avoid the high tax rates, to which business will be subject under the proposed tax bill now before Congress.

"No definite rule for determining what is reasonable in the case of expenditures for advertising can be laid down in advance so as to fit all situations and all classes of taxpayers. In determining whether the amounts are reasonable it is necessary to take into consideration all the facts and circumstances in each particular case.

"The Bureau will consider applications for individual rulings. It is, however, busy with an unusual volume of work, and it is believed that if taxpayers will keep in mind the foregoing general rules, individual rulings will not be necessary except under most unusual circumstances."

Rear Admiral Croker R.N. Visits Foxboro.

FOXBORO, Mass., September 23—In the presence of a large audience of the company's employees, Rear Admiral E. J. O'Brien Croker, R.N., chief of the British Admiralty Technical Mission, at Ottawa, Canada, paid tribute to the part which men and women of The Foxboro Company are contributing to the successful campaigns of the Allies at sea. The Foxboro Company, in addition to its regular work of producing industrial instruments of measurement and control, is separately engaged in work of a confidential nature in which the Royal Navy has reason to be interested. It was in this connection that the Admiral made his visit to Foxboro, Mass., to express official thanks for the past and present accomplishments of the company's employees, and to encourage each man and woman among them to strive for still greater production.

"Let me remind you," he said, "that almost within sight of the British Isles stretch 4000 miles of hostile shore, all the way from the Arctic Ocean to the Bay of Biscay. But with ever-increasing production of weapons, of such quality as you are helping to create, you are hastening the glorious day of an Allied victory and the world's return to peace."

Admiral Croker was introduced by Edgar H. Bristol, president of The Foxboro Company, and spoke during an intermission in a noon-hour concert of the Foxboro Company brass band. As the two men crossed the lawn where the weekly band concerts are held, the audience rose and burst into applause of welcome. The band concluded its program of patriotic music with "God Save the King" and "The Star Spangled Banner." Following the ceremony an informal committee of more than a dozen employees who are of British origin greeted the distinguished visitor.

To Open Processing Plant at Scranton

SCRANTON, Pa., October 5, 1942—Announcement that the National Paper Corporation of Ransom, will expand its operations, using a Scranton location at 101 Green Ridge Street for a processing plant which will employ twenty men, was made at the reorganization meeting of the New Industries Committee of the Chamber of Commerce held in the association building. O. E. McGregor, committee chairman, presided.

E. Perlman, president of the company, has announced his intention of opening the processing plant within a week, Mr. McGregor stated. The building involved is the property of the Paragon Plaster and Supply Company. Seven thousand, five hundred square feet of floor space will be used in the operation, which will process paper manufactured at Ransom to the correct size for marketing.

Keys To Victory Drive Progresses

The largest contribution to the "Keys to Victory" salvage drive to raise 100,000,000 keys throughout America was given when Charles Courtney, famous lock smith and collector of keys, gave 25,000 keys to the campaign. Urgently needed nickel silver will be derived from the keys in a special refinery now under construction by the Government, and the salvaged metal will go to the United States Navy where it will be used in the manufacture of vital operating parts of ships.

Courtney turned his ton of keys over to Isabel Manning Hewson, Blue Network, after an interview on her program, ("Morning Market Basket").

The Key campaign is sponsored by the Paper Industry. Proceeds from the sale of the metal will be turned over to the U.S.O. which will receive its largest single contribution to date if Americans will search every nook and corner for unused old keys and donate them to the drive.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending October 3, 1942

STOCKS

	High	Low	Last
A. P. W.	1⅞	1⅝	1⅞
Armstrong Cork Co.	29¼	28	28½
Celotex Corp.	6⅞	6½	6⅞
Celotex Corp., pf.	69	69	69
Certain-Teed Products Corp.	2½	2⅜	2½
Certain-Teed Products Corp., pf.	29¾	26¾	29⅛
Champion Paper & Fibre Co.	17⅜	17	17⅜
Champion Paper & Fibre Co., pf.	96	95¼	96
Congoleum Nairn Co.	16¼	15½	15½
Container Corp. of America	14⅛	13⅝	14⅛
Continental-Diamond Fibre Co.	6⅜	6⅜	6⅜
Crown-Zellerbach Co.	12	11⅞	12
Crown-Zellerbach Co., pf.	85½	85½	85½
Dixie-Vortex Co.	....	....	....
Dixie-Vortex Co.—A.	36½	36½	36½
Flintkote Co.	11⅞	10½	11⅞
Robert Gair	1⅝	1½	1⅝
Robert Gair, pf.	8⅜	8	8⅜
International Paper Co.	9¼	8⅜	9¼
International Paper Co., pf.	48	47	48
Johns-Manville Corp.	60⅞	59⅛	60¾
Johns-Manville Corp., pf.	125½	124½	125
Kimberly Clark Corp.	26½	26	26½
MacAndrews & Forbes	17	17	17
MacAndrews & Forbes, pf.	124	124	124
Masonite Corp.	27½	27⅛	27½
Mead Corp.	6¾	6¾	6¾
Mead Corp., pf.	65¾	65	65¾
Paraffine Companies, Inc.	31	30	31
Paraffine Companies, Inc., pf.	96½	96½	96½
Rayonier, Inc.	8⅞	8⅜	8⅞
Rayonier, Inc., pf.	25¾	25¼	25¾
Ruberoid Co.	18¾	18	18¾
Scott Paper Co.	34¾	34½	34½
Scott Paper Co., pf.	110	110	110
Sutherland Paper Co.	21¾	21⅜	21¾
Union Bag & Paper Corp.	8	7¼	7½
United Paperboard Co.	3½	3⅜	3¼
U. S. Gypsum Co.	54½	52¾	54½
U. S. Gypsum Co., pf.	....	....	....
West Virginia Pulp & Paper Co.	13	13	13

BONDS

Abitibi Pulp & Paper Co. 5s '53	49⅞	49⅞	49⅞
Celotex Corp. 4½s '47	96	95½	96
Certain-Teed Products Corp. 5½s '48	91¾	91	91
Champion Paper & Fibre Co. 4¾s '50	105¼	105	105¼
Champion Paper & Fibre Co. 4¾s '50	....	....	....
International Paper Co. 6s '55	105½	104¾	104¾
International Paper Co. 5s '47	103¾	103¼	103¾
Mead Corp. 4½s '55	....	....	....
West Virginia Pulp & Paper Co. 3s '54	103	103	103

New York Curb Exchange

High, Low and Last for Week Ending October 3, 1942

STOCKS

	High	Low	Last
American Box Board Co.	....	....	....
Brown Co., pf.	....	....	....
Great Northern Paper Co.	28½	28	28
Hummel-Ross Fibre Corp.	3⅜	3¼	3¼
National Container Corp.	8⅝	8⅛	8¼
St. Regis Paper Co.	1¾	1⅝	1⅝
St. Regis Paper Co., pf.	107	105	105
Taggart Corp.	2¾	2⅝	2⅝

BONDS

American Writing Paper Co. 6s '61	84	83	83¾

Bathurst Votes Extra Dividend

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., October 5, 1942—The Bathurst Power and Paper Company, Limited, whose executive offices are in Montreal, and its mills at Bathurst, N. B., has declared an extra dividend of 25 cents on its "A" stock. This is the second extra this year, bringing the total for 1942 to $1.50 a share. On this basis the indicated yield at the current price of 11½ is slightly over 13%. The market showed no response when the extra was announced, today's price of 11½ being unchanged in comparison with the previous close.

Reporting for the first half of 1942 about a month ago the company indicated a substantial increase in net earnings before income and excess profits taxes. Such earnings were $881,282, as compared with $645,203 in the first half of 1941.

It is evident that the $1.50 dividend will be shown as covered by a good margin this year, whatever the final figure for taxes may be, as in 1941 the earnings after taxes were equal to $2.17 per "A" share.

Union Bag Declares Dividend

Alexander Calder, president of the Union Bag and Paper Corporation, has stated that the Board of Directors of the company had declared a dividend of 15 cents a share on the capital stock of the company payable October 16 to stockholders of record at the close of business on October 10. This action, which reduces the dividend from the 25 cents a share paid quarterly for nearly 2 years, states President Calder, is taken to maintain a strong financial position in view of the uncertainties arising from the war economy.

A. P. W. Profits Up

The A. P. W. Paper Company, Inc., for the fiscal year ended June 30, 1942, reports sales of $5,514,738, compared with $3,953,810, year ago; net income $206,974, after taxes and charges, equal to $1.29 a share on 160,170 common shares; year ago net loss $56,921. Cash $475,411 compared with $62,687; inventories $880,000 compared with $647,141; current liabilities $837,444, compared with $538,992.

Mosinee Earns $1.53

The Mosinee Paper Mills Company for the year to May 31, reports a net income of $315,292, equal to $1.53 each on 205,509 shares, against $265,272, or $1.29 a share, the year before; net sales, $4,087,236, against $3,002,263.

Huyck & Sons Raise Wages

[FROM OUR REGULAR CORRESPONDENT]

RENSSELAER, N. Y., October 4, 1942—Announcement is made here of the granting of a voluntary wage increase to all employes at the mills of F. C. Huyck & Sons. Under the new arrangement the wage of each employee paid on the hourly basis will be boosted seven cents per hour in addition to any efficiency bonus that may be earned. The mills are running with day and night shifts with prospects of maintaining these schedules for some time.

Goes With Oklahoma Paper Co.

The Oklahoma Paper Company, 301-309 East California avenue, Oklahoma City, Okla., wholesale distributors and manufacturers of paper and paper products, announces that C. S. Black, formerly of Wichita, Kan., has been named manager of the firm's fine paper department.

Mr. Black has been in the paper business for 23 years, the major portion of which has been in fine paper for the printing trade.

CONSTRUCTION NEWS

Under limitations order L-41 all projects involving expenditures of more than $5,000 must be specifically approved by the War Production Board. The status of projects reported herewith under the provisions of the order is not known.—EDITOR.

Lufkin, Tex.—The Southland Paper Mills, Inc., Lufkin, manufacturer of newsprint, has temporarily discontinued construction of new additions to mill, owing to inability to secure extension of priority rating up to this time for such work, which was initially granted late last year and operative till July. Erection has been going forward for a number of months and is now about 90 per cent completed. Expansion is being carried out to double mill capacity from 50,000 to 100,000 tons per annum, comprising new chemical pulp units, paper-making machine and auxiliary equipment. George A. Hardy, 305 Broadway, New York, N. Y., is consulting engineer. Company has been securing its chemical pulp requirements from outside source, with contract terminating in January 1943. An effort is being made to obtain necessary priority to complete the new additions by that time to provide raw material for the mill.

Newport, Del.—The Lincoln Fibre and Specialty Company, Newport, manufacturer of fiber products, is planning early rebuilding of portion of mill, comprising general operating division and office section, recently damaged by fire, with loss reported close to $20,000.

Louisville, Ky. — The Mengel Company, 1122 Dumesnil street, Louisville, manufacturer of corrugated paper and other boxes and containers, has awarded general contract to the Whittenberg Construction Company, 2214 South Floyd street, Louisville, for new plant in vicinity of local works for the manufacture of certain equipment for war service for the Government. Erection will be placed under way at once. As previously noted in these columns, new structure will be three-story, about 250 x 700 feet, with several auxiliary buildings, and is estimated to cost approximately $750,000, with equipment. Financing is being provided by Defense Plant Corporation, Washington, D. C., Federal agency. Tietig & Lee, 34 West Sixth street, Cincinnati, Ohio, are architects.

Kansas City, Mo.—The Phenix Box and Label Company, 1632 Central avenue, manufacturer of folding paper boxes and containers, has taken out a permit for proposed new one-story building at 4121 Mill street, to be used for storage and distribution. Work on superstructure is being placed under way. It will be about 25 x 80 feet, and is reported to cost approximately $20,000, with equipment.

Chicago, Ill.—Fire recently damaged a portion of plant of the Alliance Box Company, 1431 West Van Buren street, manufacturer of corrugated boxes and containers. An official estimate of loss has not been announced. The damage will be replaced.

Appleton, Wis. — The Appleton Wire Works, Inc., 600 East Atlantic street, manufacturer of Fourdrinier and cylinder wires for paper mill service, has awarded general contract to the Hoffman Construction Company, 1519 North Oneida street, for new one-story addition, about 45 x 95 feet. Work is scheduled to be placed under way at once. No estimate of cost announced.

Toronto, Ont.—The Hinde and Dauch Paper Company of Canada, Ltd., 43 Hanna street, manufacturer of corrugated paper boxes and containers, is maintaining a capacity production schedule in its paper board mill, with full working force. It is expected to hold to this basis for an indefinite period. Operations in the box-making division have been curtailed, following a maximum output schedule for the first six months of this year. Production basis is being gauged on current demand. L. F. Winchell is vice-president and general manager.

To Study Manpower of U. S.

WASHINGTON, D. C., September 30, 1942—Senator Claude Pepper has introduced a resolution calling for the creation of a special committee of five senators "to make a full and complete study and investigation in cooperation with the Manpower Commission of the manpower resources of the United States and how such manpower resources should be employed to the best advantage in agriculture, industry, the armed services and other activities as consistent with the spirit of our institutions and the national emergency best to promote the war and victory for our cause."

Senator Pepper stated: "I am of the belief that a thorough study must be made of the approaching crisis in the distribution of manpower which already is attracting wide attention from agriculture, industry and the Army. I believe that some method must be found to provide for an orderly distribution of agricultural labor. We must guarantee the Nation that our food supply will be maintained and that the food-for-victory will be harvested."

To Discuss War Time Food Packaging

The next meeting of the Michigan Division of the American Pulp and Paper Mill Superintendents Association will be held on Thursday, October 15, at the Park-American Hotel in Kalamazoo. Dinner will be served at 6:30 P.M.

Dr. G. F. Des Autels, director of research for the Kalamazoo Vegetable Parchment Company, will speak on "War Time Food Packaging" dealing in particular with the packaging of Dehydrated Foods. Dr. Des Autels, who has a background of years of experience and research in the packaging field, will also be able to present some interesting facts regarding the part paper products are playing in replacing tin foil and other critical materials in the packaging of foods.

As a supplement to Dr. Des Autels discussion it has been arranged to have an officer of the United States Army make some statements regarding the requirements of the army and the problems with which they are confronted in the packaging of foods.

bearings gobbled

grease like

...hungry wolves

until this plant switched to Tycol Green Cast Greases

Lubricating a soap-cooling machine consisting of two large steam heated drums and two water-cooled rolls was a continuous problem to this plant. Steam passing through the roll hubs at 300° F. made bearings so hot that grease quickly thinned down and dripped away. Even though grease boxes were filled every day, bearings were constantly burning out. Then a Tide Water engineer recommended switching to Tycol Green Cast Grease. Since making the change this plant has ended former lubrication worries, and cut down extravagant grease consumption.

"Our practice now," says the plant superintendent, "is to put about five pounds of grease into each box and almost forget about them for two weeks or longer. Tycol is undoubtedly the right grease for the job. It stands the high temperatures and does a thorough job of lubricating. The amount of grease we save, the repair bills we avoid, and the hours of labor we do away with make this decidedly an example of how waste can be eliminated by using the correct grease." Tycol Green Cast Greases are made with fine quality cylinder oils and a minimum of soap. More cylinder oil – less soap means better lubrication under all operating conditions.

Let a Tide Water engineer show you how to step up production through efficient lubrication. Write the Tide Water Associated Oil Company, 17 Battery Place, New York, N. Y.

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War needs make it extremely important that all empty drums be returned immediately.

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PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger
EDITOR

Vol. 115 October 8, 1942 No. 15

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

WARTIME STRIKES

The rapid acceleration of the war program has been very substantially retarded by the selfish and very frequently by the unreasonable attitude of organized labor. This is not a matter of opinion but recorded fact. Many of these strikes have been unauthorized by the union leaders but this should not relieve the leaders from their duties of responsibility to control their membership. All of these strikes, however trivial, have contributed to slow up the war effort. Strikes during January, 1942, totaled 27, rose to 50 in February, increased to 66 in March, mounted to 91 in April, rose to 144 in May, to 192 in June and there were 222 stoppages of production in July, 1942.

This crippling effect on war production, states The National Association of Manufacturers, in its recently issued pamphlet, "Wartime Strikes in American Industry", is no indictment of the good faith or the patriotism of the labor union leaders who repeatedly have made the no-strike pledge to the President and to the public. It is to show that the War Labor Board, in granting membership maintenance clauses to unions as an avowed reward for their no-strike pledge, regardless of the broader issues involved, is taking a pro-union attitude by ignoring the fact that labor leaders have not delivered on their pledge. It is to show that the whole War Labor Board manner of making a national war labor policy from day to day, from case to case, is hopelessly ineffectual, and that the only remedy is for Congress to establish an equitable and national labor relations policy, leaving only the administration of that policy, not the making of policy, to a Labor Board."

Referring to the increase in strikes since Pearl Harbor, the article states in part: "During the first seven months of 1942, 9,045,256 man-hours were lost in war industries through strikes; a figure that does not include time lost by workers who, because of strikes in other plants, could not get materials for work in their own plants. (There is no way of estimating these indirect losses accurately, but it is known that the number has been considerable.) Because of the pattern of all-out war, involving both civilian and military exertions, the strikes in so-called non-war industries may have a definite destructive effect on our war effort. A strike in a chain of grocery stores in a crowded war production town, for instance, would not be classified as a war industry strike, yet it can have a disastrous effect on the morale and the direct needs of the home front workers. A milk or transportation strike also can work extreme hardships in any busy area. In fact, practically every instance of work disruption in non-war industries has its effect on the total war effort, so closely are the civilian economy and the military requirements intertwined."

In discussing the important effect of small strikes the article goes on to say that, "A strike involving only a small number of men in one plant may be responsible, through stoppages in the manufacture of some vital parts for use in other plants, for a much more serious lag in our war effort. This has happened in many cases." The total man-hours lost in all strikes within the United States, January to May, 1942, as compiled by the U. S. Bureau of Labor Statistics, is 15,720,000. "Many labor stoppages in war plants," the article continues, "have been the result of outlaw strikes and jurisdictional disputes. In the former instances, the workers strike in defiance of their union leaders; in the latter instances, the workers strike when members of rival unions undertake some work. There is no complaint against management; it is merely a fight between unions. But war production stops."

In commenting on the lack of complete data on wartime strikes, threats of strikes, unnecessary absences from work, and other disruptions, the comment states that, "Due to past and present muddle in the strike-reporting system, there is no way of accurately setting forth any complete figures on the over-all delay imposed upon war production by labor stoppages, not to mention slow-downs. Neither is there any way of fully reporting how badly production has been delayed and hampered in many instances by the 'threat' of strikes. There is the recent case of a large shipyard. Workmen there got into a dispute which involved the operators of welding machines. The 'dispute' never was dignified by the name of 'strike'; yet it continued for 30 days and the production of ships to supply America's lifeline to the fighting fronts was held up because of a stoppage in welding work. Another untold figure is the amount of time that management has been forced to expend

in seeking to negotiate and arbitrate disputes and grievances not involving actual strikes."

In summarizing some of the facts about recent strikes in war plants, this informative article states that, "Union labor leaders representing only 20% of the total of American laborers, made the no-strike pledge following Pearl Harbor, but union labor has been responsible for almost all of our strikes. In fact 99% of all work stoppages have occurred in unionized plants." In view of the unprecedented liberality conferred upon labor by the policy of the Administration, it appears from this presentment of wartime strikes that unionized labor has conspicuously failed to discharge its duty, as citizens and as workers. Not all, but far too many union workers have and apparently continue to "let the country down." If this serious situation cannot be remedied by the union leaders, then the order to "work or fight" may be the necessary alternative.

Barytes Deposits Worked in Ireland

WASHINGTON, D. C., October 7, 1942—A newly discovered deposit of barytes in Ireland is now being worked, according to information reaching here. The deposit is located on the border between Sligo and Leitrim counties.

Largely used in the paper industry in connection with manufacture of photographic papers, barium sulphate supplies formerly went to Canada and the United Kingdom from Continental European sources. With zinc sulphide, barium sulphate forms lithopone, which is used for sizing for light sensitive papers.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1942		Corresponding Weeks—1941	
August 22	81.2	August 23	102.8
August 29	82.8	August 30	102.4
September 5	83.2	September 6	84.8
Sept. 12. (Holiday Week)	71.2	September 13	104.2
September 19	83.9	September 20	103.8
September 26...(Prelim.)	87.5	September 27	105.9

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1941	85.6	89.7	92.2	96.0	98.7	99.3	94.2
1942	104.5	103.9	102.9	100.4	95.4	87.3	75.8

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1941	101.0	99.7	105.2	106.2	100.4	97.4
1942	80.8	...	...	...	...	...

COMPARATIVE YEARLY SUMMARIES

	1935	1936	1937	1938	1939	1940	1941	1942
Year to Date..	68.7	78.2	86.1	69.4	79.5	86.2	95.0	92.3
Year Average.	69.9	80.4	79.8	71.5	83.4	85.6	97.4	...

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1937	83	89	89	91	88	80	69	77	72	70	57	47	75
1938	56	63	63	60	60	59	59	60	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	82	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	..	..	..	..	..

Week ending Aug. 22, 1942—74
Week ending Aug. 29, 1942—77
Week ending Sept. 5, 1942—78
Week ending Sept. 12, 1942—65
Week ending Sept. 19, 1942—81
Week ending Sept. 26, 1942—78

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

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15 WEST 47th STREET NEW YORK, N. Y.

Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
Edited by R. G. Macdonald, Secretary

Folding Carton and Fiberboard Substitutes for Metal Containers*

By J. D. Malcolmson[1]

Abstract

The folding carton industry is working on two developments as substitutes for tin cans—namely, a heat sealed bag inside of a carton and a wax dipped carton. The fibreboard container is substituting for large sized tin cans by the use of heat sealed inner bags.

On this program several specialists are going to give us detailed stories on wartime packaging conversions; therefore, the present paper will simply summarize the subject without going into details.

Paper and Paperboard Containers

The sudden curtailment of tin for packages has naturally caused shippers to search everywhere for practical substitutes. One of the first products considered was glass, but here they encountered the need of rubber gaskets for making airtight closures. One raw material after another joined the critical list until it was realized that the logical package was some form of paper or paperboard carton or fiber container. With the exception of a brief artificial shortage in paperboard last winter, there has always been an ample supply of this material and no doubt this will continue for the duration of the war. However, many of the articles that previously used tin containers require a package that is either airtight, moisturetight, and greaseproof, and of course the ordinary folding carton does not meet these specifications. In order to find the answer, however, the paperboard manufacturers have literally crowded 20 years of research into the last 20 weeks, and as a result has already produced two outstanding answers to the tin can shortage: namely, the bag-in-carton and the wax-dipped carton.

Actually this development was not as sudden as it sounds, because this industry has been attempting to produce a liquidtight package for the past 10 years or more, and I have on my desk a folding carton fitted with an inner bag which was filled with water April 1, 1936 and which has withstood 6 winters of steam-heated atmosphere and low humidity and yet still contains most of its water. The obvious question as to why such a package was not placed on the market sooner is easy to answer with the one word, cost.

An inventor of paperboard packages to hold liquids often makes the error of weighing a tin can and multiplying that weight by the cost of tinplate, and then weighing his paperboard product and multiplying that by the market price of paperboard. The result is so greatly in favor of paperboard packages that he immediately gets excited. What he fails to realize, however, is that the tin can industry has had generations in which to perfect and speed up its can-making machinery, so that today tin cans are made at an almost incredible speed and with practically no defectives. This means that the value of the tinplate really is one of the principal elements of cost. To do the same thing with a paperboard package that will hold liquids is, however, an entirely different matter in that there is no existing equipment for the manufacture of such containers. Even after such equipment is developed, it will take a considerable time to perfect it to the stage that it will produce containers at high speed and without defectives. Therefore, in this case the cost of the raw materials is relatively minor as compared with the cost of manufacture. A true comparison of cost has indicated in the past that some of these paperboard cartons with inner bags actually ran higher than the equivalent tin can.

This matter of cost during normal times had served to prevent the marketing of a satisfactory liquidtight container, but in abnormal times such as the present this entire situation is changed. Thus, a shipper who is paying say 3c for his present tin can and who suddenly finds that there is no more tin available, would gladly pay 3c or even 4c for a paperboard container that would satisfactorily package and deliver his merchandise. Another thing that we have to worry about is that handmade samples of liquidtight folding cartons often look good, but in production if only one carton out of 100 were defective and caused leakage, this not only would give the whole development a black eye, but the leaking carton would probably destroy many of the other cartons in the same outer container. Therefore, it is imperative that we "make haste slowly."

Liquidtight Containers

As mentioned above, the folding carton manufac-

*Presented at the Fall Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Statler, Boston, Mass., Sept. 29-Oct. 1, 1942

[1] Member TAPPI, Technical Director, Robert Gair Company, Inc., New York, N. Y.

turers are attempting to meet this crisis along two lines: first, a bag-in-carton, and second, a wax-dipped carton. In the first instance we depend on a heat-sealed bag to make the package air or liquid tight and then use an outer folding carton to provide rigidity and protection from puncture, as well as shelf appeal. Originally it was found that pliofilm offered an ideal material for this inner bag due to its excellent heat-sealability and its flexibility, together with its resistance to the passage of grease and moisture vapor. Now that this material has become critical, the pulp and paper industry by intensive research has developed heat-sealable films made of relatively noncritical materials which are still available. In some cases these are made of transparent cellulose, in other cases of waxed paper such as glassine, and in still other cases in laminated combinations of these and other papers. Also the leading bag manufacturers have perfected methods of making improved-type bags from these materials. Other companies who make heat-sealing equipment have developed inexpensive, yet effective machines, for heat sealing not only the side seam of the bag but also the top.

In still other instances, the bag is built right into the carton at the time the latter is first manufactured. While it is true that these heat sealers are made of critical materials, we have found that the government is liberal in granting priorities for the purchase of such equipment, when this means maintaining on the market essential merchandise previously packed in tin cans.

Weatherproof Containers

The development of the wax-dipped carton was necessary to meet the demand for a package that will withstand outside moisture even to the point of complete immersion in water without disintegrating and without injuring the contents. These contents may, if desirable, be protected by an inner bag and such a combination is illustrated by the Army Field Ration packages. In other cases the principal protection is needed on the outer surface only and here we might use the recently developed small-arms ammunition package as an illustration. In either case the carton itself must be very accurately manufactured so that it is almost airtight when first sealed up, and this sealed carton is then conveyed through a bath of molten wax.

Ordinary waxes such as paraffin will not usually suffice and recent study has developed special blends of waxes for this purpose which have the unusual quality of deep penetration, instant setting upon withdrawal from the bath (to seal up any small pin holes or blow holes), and relative flexibility when cold. This latter property is especially valuable as otherwise when the package is dropped, the wax might fracture and permit the entrance of water. Of course, during peacetimes we were familiar with this idea of dipping in wax but its relative high cost prevented wide developments in this field, except for a few special commodities which required this exact treatment. Undoubtedly the large volume of wax-dipped packages which will be produced before the war is over will lead to lower costs.

The fiber container manufacturers are also participating in this form of package research. For instance, in the frozen egg industry it is estimated that during 1942 upward of 350 million pounds will be produced. Ordinarily these shelled frozen eggs would be packaged 30 pounds to a cylindrical tin can. Because these are no longer available, most of these frozen eggs are now going into a 30-pound corrugated container equipped with a transparent cellulose inner bag. This package stands up well under freezing, storage, and defrosting and in addition occupies much less space than the cylindrical container. Undoubtedly the same form of package will expand into dehydrated vegetables and many other commodities.

Conclusion

In conclusion we wish to remind our audience that the new war time packaging developments being discussed today are all more or less in their infancy. Undoubtedly if this present symposium were repeated six months from now, we would be able to show you a great many commercial packages as more of them are being added to the dealers' shelves almost daily. There seems no doubt but what many of these fundamental developments will persist after the war is over so that we may very well be witnessing a revolutionary change in many of our packaging methods.

Westinghouse Receives Army-Navy Pennants

Rear Admiral William Carleton Watts of the United States Navy recently presented Army-Navy "E" pennants to five Pittsburgh-area plants of the Westinghouse Electric and Manufacturing Company "for high achievement in the production of war equipment." Selected to receive the awards were the Transformer Division at Sharon, Pa., and the East Pittsburgh Division, which includes the porcelain plant at Derry, Pa., Nuttall Gearing Works in Pittsburgh's Lawrenceville section, and plants at East Pittsburgh and Trafford, Pa.

Accompanied by Navy and Army officers, the admiral visited the Derry plant and praised workers for their production of porcelain parts for military communication equipment. The officers also inspected the Trafford works which makes metal castings for electric motors and generators in addition to plastic Army helmet liners and parts for airplanes.

The blue and red Army-Navy flag awarded the East Pittsburgh Division now flies above the giant East Pittsburgh works. Covering almost 80 acres, this plant is now turning out equipment at a rate 60 per cent ahead of 1941—producing generators to create electricity for war plants, motors to drive machinery, and control and switchboard apparatus to regulate electric power.

Admiral Watts inspected the Nuttall plant and addressed the workers who make gears for Naval vessels. Later he presented the production award to the Transformer Division at Sharon, Pa., which manufactures transformers required to step up or step down voltages in the transmission of electric power.

Accompanying Admiral Watts and the military party and serving as master of ceremonies was Milton Cross, widely known announcer for the Blue Network. At the Derry plant program Mr. Cross introduced Lieut. Commander C. E. Egeler of the United States Naval Reserve who presented Army-Navy pins to four representatives of Derry employees.

The representatives were Charles Brown, Jr., Miss Jean Johnson, John Lyons and C. D. Hall.

Army-Navy pins were awarded to all the thousands of employees in Westinghouse plants receiving the production pennants.

Developments in the Treatment of Water*

By Eskel Nordell[1]

Abstract

The Spaulding Precipitator may be used (1) for softening water to any required degree down to an ultimate limit of about 17 p.p.m, (2) for removal of silica from water by the use of dolomitic lime, (3) for removal of turbidity and color, and (4) for removal of tastes and odors. New rectangular designs require less space and are simpler to construct than conical or pyramidal designs. The Spiractor is a new type of cold lime water softener which requires only a 5- to 10-minute detention period and produces a granular byproduct instead of the usual sludge. The rotary surface washer is a device which eliminates mud-ball formation from filter beds and requires only 0.5 to 1.0 g.p.m. per sq. ft. of filter bed area for its operation. Carbonaceous or organic zeolites may be employed either on the sodium cycle, regenerated with common salt, or on the hydrogen cycle, regenerated with sulphuric acid. When employed on the hydrogen cycle, they will remove sodium as well as calcium and magnesium. Demineralization of water is effected by passing it first through hydrogen zeolite, then through an acid removing substance and finally through a degasifier. Results are given which show that the effluent compares very favorably with distilled water while the average operating cost is only some 5 to 15% of the cost of distillation.

The old proverb "There is nothing new under the sun," is to a certain extent true. Filtration is older than the hills, much older, because it dates back to the period when water in the liquid phase first appeared in the universe and filtered through rocky strata. Ion exchange processes, such as the zeolite process, are old as they have been carried out in nature for countless millions of years. And, as for silica removal, the opals, agates, and petrified forests testify to the great antiquity of this process. I am glad, therefore, that my paper deals with "recent developments" and not with "new processes."

A case in point is the cold lime-soda process of softening water. This process is over a hundred years old but the Saulding precipitator and Spiractor types of equipment used in carrying it out are recent developments. So also are the applications of the Spaulding precipitator to the problems of removing turbidity, color, taste, odor, and silica from water. Similarly while the ion exchange process of water softening may now be called old, the carbonaceous types of zeolites, capable of acting either on the sodium cycle or the hydrogen cycle and the anion removers are recent developments. Surface washers for filters and softeners likewise are not new but the rotary surface washer represents a recent and noteworthy development. More efficient and more economical types of designs and those using a minimum of critical materials are represented among the recent developments. These are the things that will be briefly covered in this paper.

Precipitator

Most of you are familiar with the general design and principles of operation of the Spaulding precipitator. Essentially, it consists of two compartments; one for mixing and thoroughly agitating by mechanical means the raw water, treating chemicals, and previously formed sludge and the other for settling and filtering the treated water upwardly through a suspended blanket of sludge. The first compartment is wider at the bottom than at the top; the second compartment is wider at the top than at the bottom and the flow of water is downward in the first

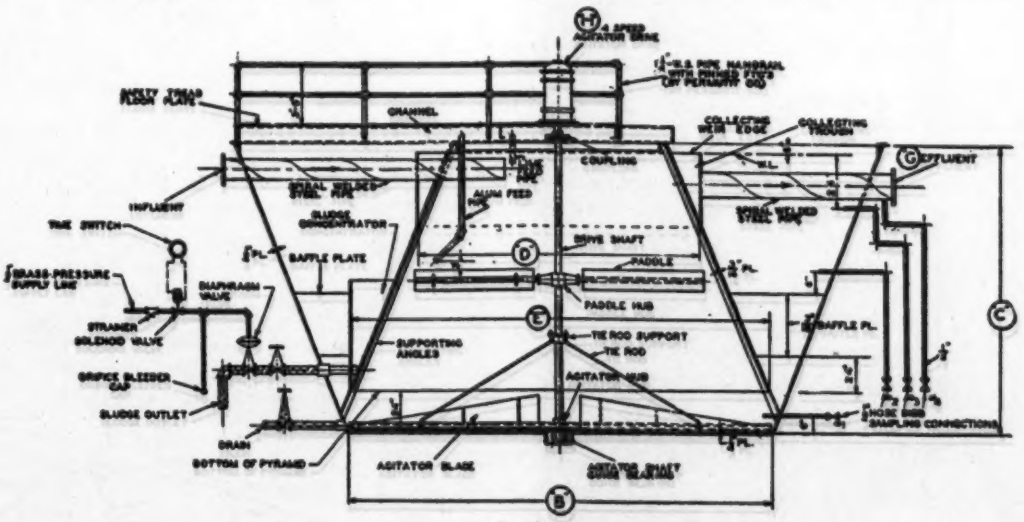


FIG. 1
Spaulding Precipitator. Conical or Pyramidal Design. (Cross Section)

* Presented at the Fall Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Statler, Boston, Mass., Sept. 29-Oct. 1, 1942.

[1] Technical Dept., The Permutit Co., New York, N. Y.

compartment and upwards in the second compartment. Excess sludge is removed through a sludge thickener, either continuously or intermittently and either by automatic or manual operation.

Figure 1 shows the inverted conical or pyramidal type of design using a vertically disposed shaft for the agitator paddles. This design is applicable to an all-steel, steel and concrete, or all-concrete type of structure.

Figure 2 is of the rectangular type of design using horizontally disposed shafts for the agitator paddles. The walls of the outer compartment are of concrete and the sloping partitions dividing the two compartments are of steel or plywood. This rectangular type of precipitator is favored because of the simplicity of constructing the forms for the concrete work and the minimum of ground space which it requires.

Other designs are available and many of these are applicable to existing settling tanks or basins. Where existing settling tanks are tall, it is possible to use a double-deck design, thus greatly increasing their capacities. The conversion consists of inserting compartments, so as to form two precipitators, one over the other, in the existing tank.

Uses of the Precipitator

Water Softening: By varying the dosages of chemicals in the precipitator, the degree of softening accomplished may be varied to any degree required down to an ultimate limit of about 1 grain per gallon (17 p.p.m.). Thus, for many mill purposes, reduction of the calcium alkalinity to 2 grains per gallon (35 p.p.m.) is sufficient to stop scale formation in condensers, on other water-jacketed equipment, hot water piping, stock chests, deckers, screens, recirculating systems, bleach tanks, etc. This degree of softening may be accomplished at low cost, and this is especially the case with mills equipped with causticizing equipment, because the mills may recover both the lime added to accomplish the softening and that removed from the water. In other words, almost twice as much lime may be recovered as is used in the treatment.

On the other hand, if removal of magnesium hardness or permanent hardness is required for certain purposes, this may be accomplished by using soda ash and larger amounts of lime. The analyses before and after treatment in Table I show under (a), the results accomplished by treating for reduction of only the calcium alkalinity and under (b) the results accomplished by complete softening. Results at any points between these may be achieved.

TABLE I

	A		B	
	Raw Water	Softened Water	Raw Water	Softened Water
Total Hardness as $CaCO_3$.....	234	86	136	19
Calcium Hardness as $CaCO_3$....	178	31	118	11
Magnesium Hardness as $CaCO_3$.	56	55	18	8
M.O. Alkalinity as $CaCO_3$.....	193	43	5	68
Phenol Alkalinity as $CaCO_3$.....	0	17	0	45
Free Carbon Dioxide as CO_2....	14	0	16	0

(All results expressed in p.p.m.)

Silica Removal: Many water supplies contain a sufficient content of silica to form silica scale in high-pressure boilers and turbines. Such scales are exceedingly hard and troublesome have a low thermal conductivity, and are difficult to remove. In the percipitator, the silica content of such water may be reduced to any desired degree by using dolomitic lime in place of high-calcium lime in the softening process. This process of silica removal has the additional advantage of not increasing the dissolved solids content of the softened water.

Turbidity and Color Removal: By carrying out the coagulation of turbid or colored waters in the precipitator, an efficient removal of the turbidity and color may be accomplished with a minimum amount of coagulant. A further advantage of using the precipitator for this purpose is that, because of the low turbidity of the precipitator effluent, as compared with the older types of coagulation equipment, the load on the filters is greatly reduced and the periods between backwashings is greatly increased.

Table II shows under (a) typical results secured with the precipitator on a highly varying turbid river water and under (b) results secured by treatment of a highly colored surface water.

Taste and Odor Removal: Some waters contain

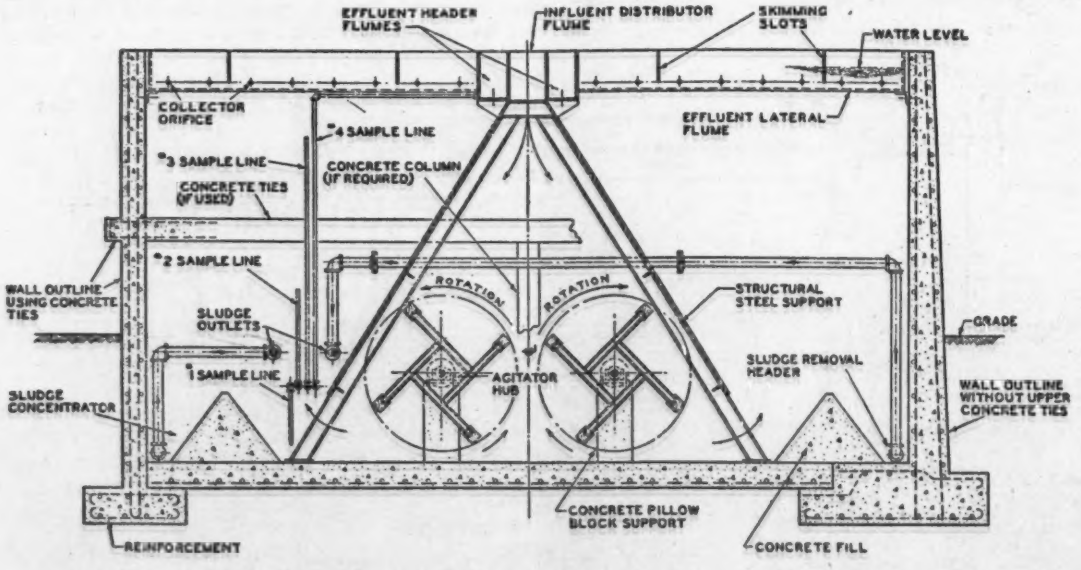


Fig. 2

Spaulding Precipitator. Horizontal Design. (Cross Section)

objectionable tastes and odors which possibly may be adsorbed by the pulp or paper being manufactured. The use of powdered activated carbon for removal of such tastes and odors from water is common practice. Due to the extremely intimate contact provided, the use of the precipitator for this purpose has been found to effect economies of from 3 to 40% in the dosage of activated carbon required.

The Spiractor

The Spiractor is a recent development in lime-soda water softening equipment and this was first described in a paper by Tiger and Gilwood at the TAPPI Annual Meeting last February. As shown in Figure 3, this consists of an inverted conical tank in which the softening reactions take place in the presence of a suspended bed of granular calcium carbonate catalyst.

TABLE II

	A			B	
	Raw Water	Precipitator Effluent		Raw Water	Precipitator Effluent
Turbidity	50	5	Color	58	2
Turbidity	600	5	Color	56	4
Turbidity	1600	5	Color	56	2
Turbidity	2500	5	Color	60	3
Turbidity	1600	5	Color	60	3

(All results expressed in p.p.m.)

The remarkable features of this type of softening equipment are its small size—5 to 10 minutes detention period—and that the precipitant and removed hardness are discharged in a granular form instead of as the usual wet, pasty sludge. This granular material is extremely easy to handle as it drains to less than 5% of moisture in a relatively short period and consequently can be handled much like a slightly damp sand. This granular product is formed by the precipitating materials separating out as accretions on the fine graules of calcium carbonate catalyst. These grow in size and as the bulk of material increases, its level is kept down within certain limits by withdrawals of the largest particles from the bottom. Periodic additions of new catalyst are required.

This new catalyst may be made by regrinding and screening a portion of the discharged material. Where removal of only the calcium hardness is required, the discharged material may be reburned thus recovering lime from both the added materials and that removed from the water.

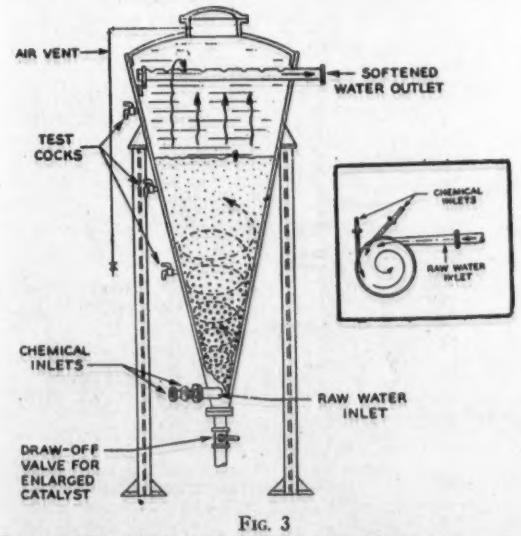


FIG. 3
Spiractor (Cross Section) Flow. Inset Gives Detail of Arrangement of Raw Water and Chemical Inlets

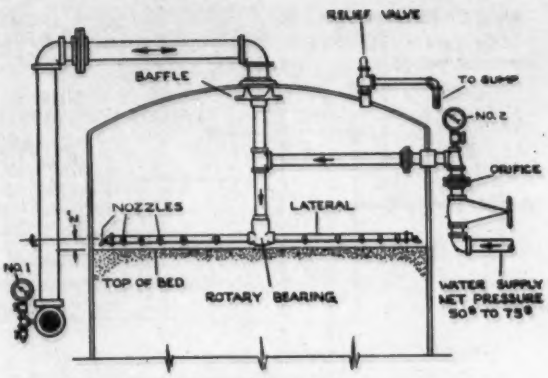


FIG. 4
Rotary Surface Washer as Installed in a Pressure Filter

Table III shows the results secured in two Spiractor water saftening plants where reduction of the total hardness to slightly less than 5 grains per gallon (85 p.p.m.) are required.

Rotary Surface Washers

Troublesome mud-ball formations on filter-bed surfaces are not a new phenomenon. Instead, they have been known ever since filter beds were first put into operation, and various efforts have been made to get rid of them. One of these was to increase the backwash rate. This did make the mud balls disappear from view but, unfortunately, the way in which they disappeared was simply by sinking down deeper in the filter bed.

Washing of the filter-bed surface with a hose either with or without the use of a rake has been used. Various other arrangements of perforated headers and laterals, disposed either slightly over or slightly under the surface of the filter bed were used. These methods usually had the defects of being either too laborious to operate often enough or to wasteful in the amounts of water required to operate them.

The rotary surface washer represents a recent development that is free from both of these defects. This washer, a shown in Fig. 4, consists of a pair of rotating horizontal pipe arms supported directly above the top of the bed by a ball bearing made of rustless material.

A single row of jets, on the opposite side of each arm, discharges the water at high velocity downwardly and backwardly. The reaction of these jets, which are directed at an angle to the surface of the filter bed, causes the two arms to revolve and, during the revolution, the nozzles on the arms are thus moved through the concentric circles. At the end of each arm there is a nozzle, pointing radially outward and downward which cleans the sand adjacent to the filter walls and reaches the sand in corners of rectangular filters.

The water used in the rotary washer should be under a minimum of 50 p.s.i. pressure and this water, issuing from the jets at high velocities, disintegrates mud balls and thoroughly scours the sand. Yet the amount of water actually used in the rotary surface washer is small—only 0.5 to 1 g.p.m. per sq. ft. of filter bed area. These washers may be employed in either pressure or gravity types of filters and the results obtained have been excellent.

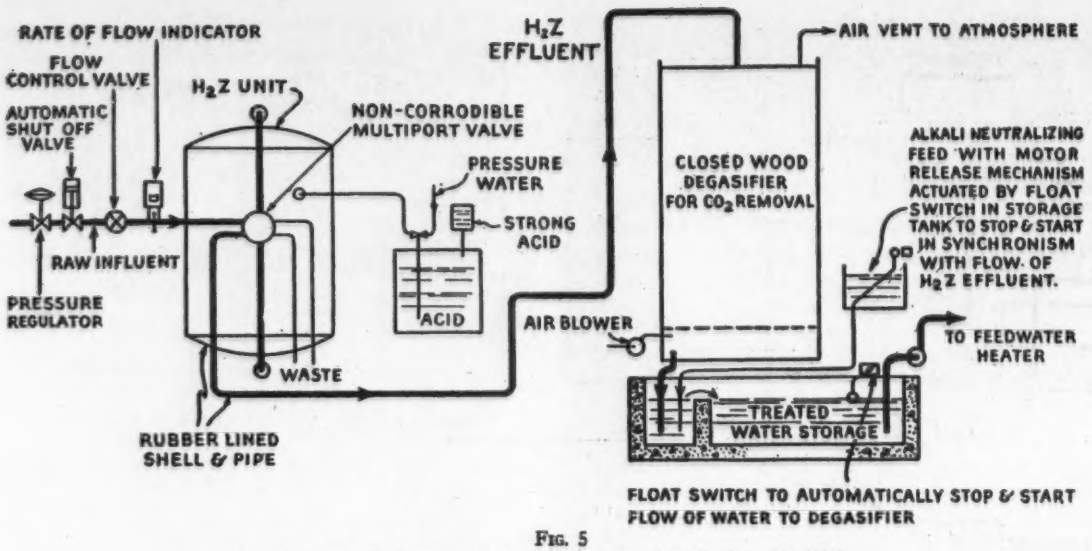

RATE OF FLOW INDICATOR
FLOW CONTROL VALVE
AUTOMATIC SHUT OFF VALVE
RAW INFLUENT
PRESSURE REGULATOR
H_2Z UNIT
NON-CORRODIBLE MULTIPORT VALVE
PRESSURE WATER
STRONG ACID
ACID
WASTE
RUBBER LINED SHELL & PIPE
H_2Z EFFLUENT
AIR VENT TO ATMOSPHERE
CLOSED WOOD DEGASIFIER FOR CO_2 REMOVAL
ALKALI NEUTRALIZING FEED WITH MOTOR RELEASE MECHANISM ACTUATED BY FLOAT SWITCH IN STORAGE TANK TO STOP & START IN SYNCHRONISM WITH FLOW OF H_2Z EFFLUENT.
AIR BLOWER
TO FEEDWATER HEATER
TREATED WATER STORAGE
FLOAT SWITCH TO AUTOMATICALLY STOP & START FLOW OF WATER TO DEGASIFIER

FIG. 5
Flow Diagram Hydrogen Zeolite Process Plus Neutralization with Alkali

Carbonaceous Zeolites

While the old siliceous types of zeolite may be operated only on the sodium cycle, the recently developed carbonaceous or organic zeolites may be operated on either the sodium cycle or the hydrogen cycle. On the sodium cycle, they are regenerated with common salt and behave similarly to the siliceous zeolites in that they abstract calcium and magnesium from hard water and replace it with sodium.

On the hydrogen cycle, these zeolites are regenerated with a mineral acid, usually sulphuric acid, instead of salt and, on the softening run, they abstract not only calcium and magnesium but also other bases such as sodium, and these they replace with hydrogen. This is of particular value with bicarbonate waters, because the bases of the bicarbonates are removed, and nothing is left in the water except the theoretical carbonic acid which dissociates into water and free carbon dioxide, the latter of which can then be removed by aeration. Thus, if a water contained only bicarbonates, the aerated effluent would be practically the same as distilled water.

If chlorides or sulphates are present, the corresponding acids are formed. These may be neutralized by the addition of a small amount of alkali as is shown in Fig. 5 or, as shown in Fig. 6, one portion of the raw water may be passed through a hydrogen zeolite unit and another portion through a sodium zeolite unit, and then the two effluents are mixed in such proportions that there is enough alkalinity in the sodium effluent to neutralize the acidity in the hydrogen effluent and furnish whatever alkalinity is required in the mixed effluent.

TABLE III

	A		B	
	Raw Water	Softened Water	Raw Water	Softened Water
Total Hardness as $CaCO_3$	271	76	320	72
Calcium Hardness as $CaCO_3$	165	12	175	10
Magnesium Hardness as $CaCO_3$	106	64	145	62
M.O. Alkalinity as $CaCO_3$	382	184	330	70
Phenol Alkalinity as $CaCO_3$	0	92	0	36
Free Carbon Dioxide as CO_2	10	0	15	0
Iron as Fe	0.3	0.1	0.4	0.1

(All results expressed in p.p.m.)

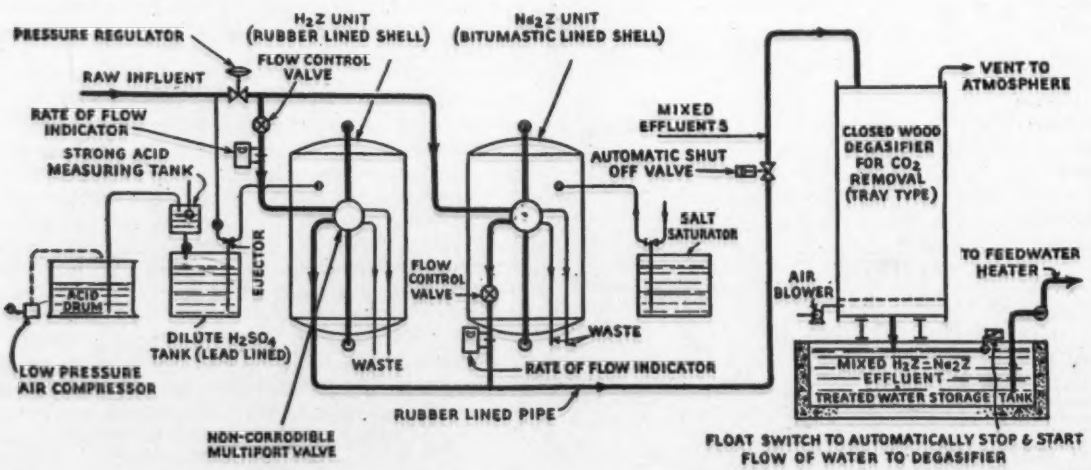


FIG. 6
Flow Diagram Hydrogen Zeolite and Sodium Zeolite Units

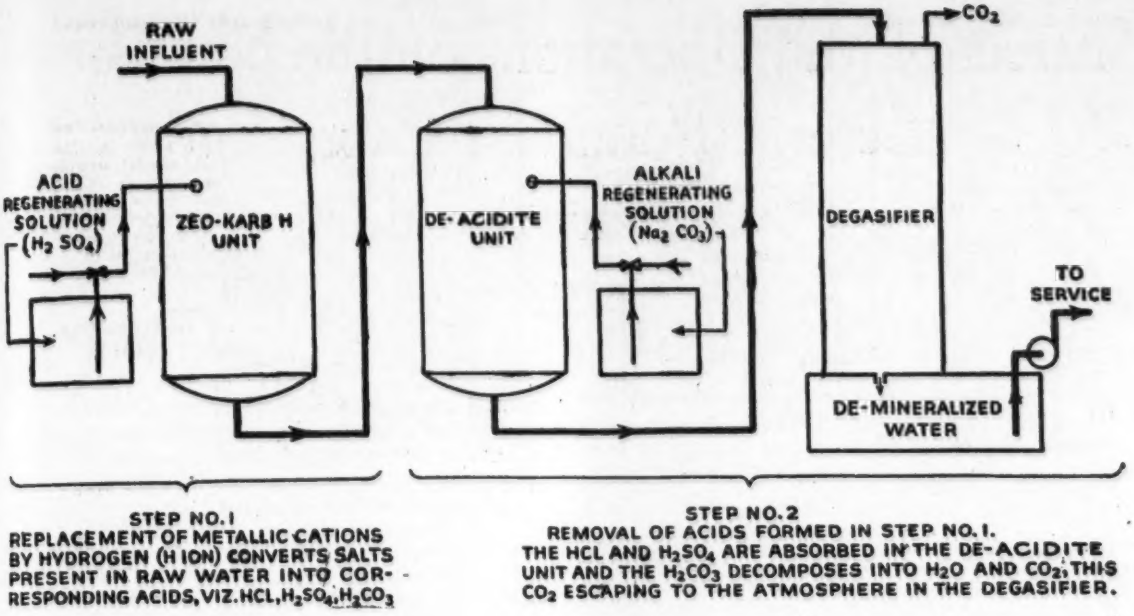

RAW INFLUENT
ACID REGENERATING SOLUTION (H_2SO_4)
ZEO-KARB H UNIT
DE-ACIDITE UNIT
ALKALI REGENERATING SOLUTION (Na_2CO_3)
DEGASIFIER
CO_2
TO SERVICE
DE-MINERALIZED WATER
STEP NO. 1
REPLACEMENT OF METALLIC CATIONS BY HYDROGEN (H ION) CONVERTS SALTS PRESENT IN RAW WATER INTO CORRESPONDING ACIDS, VIZ. HCL, H_2SO_4, H_2CO_3
STEP NO. 2
REMOVAL OF ACIDS FORMED IN STEP NO. 1. THE HCL AND H_2SO_4 ARE ABSORBED IN THE DE-ACIDITE UNIT AND THE H_2CO_3 DECOMPOSES INTO H_2O AND CO_2, THIS CO_2 ESCAPING TO THE ATMOSPHERE IN THE DEGASIFIER.

FIG. 7
Process for Demineralizing Water. Flow Diagram

Previous to the introduction of the carbonaceous zeolites, the only method known of removing sodium bicarbonate from water was distillation. With the carbonaceous zeolites operating on the hydrogen cycle, sodium bicarbonate may be removed together with calcium and magnesium bicarbonates. This process therefore has been of especial value in softening boiler feedwater from mills operating on waters containing sodium alkalinity.

Demineralization

A later development has been that of the anion exchangers or acid removers such as *De-Acidate*. This graular material is used in much the same manner as a zeolite, that is by simply percolating the water through a bed of it. It differs, of course, in that it removes acids instead of bases and is regenerated with a solution of an alkali such as soda ash. The removal is probably an adsorption of the entire acid molecule rather than just the acid ion. Carbon dioxide has no effect on it and passes through unchanged.

Figure 7 is a flow diagram of this demineralization process. The raw water first passes through a hydrogen zeolite unit which removes the bases and replaces them with hydrogen, the net effect of which is to convert the bicarbonates into carbon dioxide, the chlorides to hydrochloric acid, and the sulphates to sulphuric acid.

TABLE IV

	A		B	
	Raw Water	Demineralized Water	Raw Water	Demineralized Water
Total Hardness as $CaCO_3$	212	0	302	1
M.O. Alkalinity as $CaCO_3$	140	6	227	4
Chlorides as Cl	24	2	25	0
Sulphates as SO_3	80	1	60	1
Free Carbon Dioxide as CO_2	23	6	25	5

It next passes through the *de-acidite* unit which removes the hydrochloric acid and sulphuric acid. From this it passes through a degasifier which removes the carbon dioxide, and an effluent is furnished which is practically the same as a distilled water in composition as is shown in Table IV, which gives the analyses of the raw water used and the results obtained in two plants using this demineralization process. The operating costs vary according to the composition of the raw water but, in general, are from 5 to 15% of the cost of distillation.

Lunchrooms For Employees

Adequate nutrition for workers is an acute problem today. Plants have sprung up in new locations where eating facilities are frequently inadequate; growth in personnel of existing plants has taxed existing managements; antisabotage restrictions discourage box lunches; increased night shifts have complicated the ordinary problems of meals on the job. Because of these and other contributing conditions, many companies are investigating the question of lunchrooms for employees. To meet the demand for information, the Policyholders Service Bureau of the Metropolitan Life Insurance Company recently issued a detailed study entitled "Lunchrooms for Employees."

The report discusses and illustrates physical layout, offering practical data on equipment, management, and menus. Several types of eating facilities are described. Among them are: coffee or lunch counter service, the rolling cafeteria, and the cafeteria serving complete meals. Some companies have encouraged the establishment of diners or other restaurants on company property. A number have installed equipment for serving "snack" meals during shifts. These various services are described.

The problem of serving meals that will be both tempting and nourishing is touched upon, and typical menus are reproduced to indicate the kinds of meals served in representative employee lunchrooms.

Copies of this report are available to executives who on their business stationery address the Policyholders Service Bureau, Metropolitan Life Insurance Company, One Madison avenue, New York, N. Y.

Effect of Mill Operations on the Number of Bacteria Found in Paper and Paperboard Products

By J. R. Sanborn[1]

Abstract

Many mills find that bacteriological count standards for paper and paperboard products are useful as a guide to efficient mill operation and satisfactory quality. While some mills normally have little difficulty in maintaining strict control over microbiological growths, studies reveal important sources of growth which, unless properly controlled, are frequently responsible for high counts in pulp, paper, and paperboard. Where microorganisms are allowed to develop at one or more focal points of growth, many species and varieties are usually encountered in stock systems which may also be found in finished paper and paperboard products.

Various physico-chemical and biological factors in mill systems exert a protective action on microorganisms which enables them to resist the lethal effects of chemical reagents and heat. These protective factors are not well understood and should receive careful and critical study.

Introduction

When mills first attempted to produce paperboard of low bacterial content, they soon discovered that it would be necessary to exercise unusual care and follow certain precautionary measures in order to achieve this objective with regularity.

In many cases the preventive methods employed merely involved greater cleanliness, more efficient and properly controlled procedures for killing microorganisms or suppressing their development. The determination of bacteriological counts in finished paper and paperboard has provided mills with an additional method for estimating the effectiveness of these procedures and the improvements introduced. There is available an abundance of data that testify to the benefits of the preventive measures utilized, in increased production, higher pulp yields, improved quality, suitability, and usefulness in the finished products. The most recent evidence of these benefits is revealed in the applications of paper and paperboard products to the specific requirements of war work. Slime control is doing much toward the elimination of weak spots and holes in sheets used in the packaging of metal plate and munitions. Definite advantages are also being realized in meeting the severe requirements of suitable packages for dried foods and similar goods for shipment abroad.

While control of microorganisms for economic reasons is sometimes considered as quite separate from the type of control that is utilized for the purpose of producing paper and paperboard of low bacteriological content, such a distinction is basically rather tenuous. While, in the latter instance, preventive and control measures are applied more carefully, thoroughly, and systematically, the general procedures and objectives are similar for both purposes. Mills that follow a policy of thoroughness with respect to cleanliness and prevention of microbiological development, are usually successful in materially reducing bacteriological counts in finished products and in avoiding economic losses due to microorganisms. It is generally true that where mills fail to establish effective control over microorganisms, as reflected in high counts of paper or paperboard, they almost invariably neglect or overlook one or more sources of microbiological growth. It has been repeatedly demonstrated, however, that where mills are successful in preventing colonization or build-up of growth at these points, made possible through careful and thorough control procedures, reductions in bacterial counts are obtained with fair consistency.

Paperboard for Milk Containers

During the early stages of the present study (1937-1938), about 20 mills were engaged, more or less actively, in the manufacture of paperboard for milk containers. While the greater part of the board produced by these plants met a standard of not more than 500 colonies per gram of disintegrated stock, which was suggested at the time as a reasonable requirement, a few mills had some difficulty in doing so. Since 1939, however, the majority of the 7 or 8 mills that have continued to make this grade of board have experienced little trouble in meeting a standard of 500 or even 250 colonies per gram.

Regardless of the sanitary significance of these or other standards that may be set for paper and paperboard of various grades, many mills are relying upon some bacteriological count standard for estimating the effectiveness of their microbiological control procedures. Several of the largest producers of paper and paperboard used in the packaging or handling of perishable foods, have been working toward the manufacture of essentially sterile products, that is, products which show by standard methods of bacteriological analysis, that viable microorganisms are practically absent or that so few are present as to render accurate counting by plating methods nearly impossible. Table I shows the general improvement that has taken place in the bacteriological condition of paperboard used in the fabrication of milk containers.

Relationship between Counts and Caliper of Sheets

It is interesting to note in Table I that in nearly all cases there is a progressive increase in percentage of counts that are reported as developing less than 10

Approved by the Director of the New York State Agricultural Experiment Station for publication as Journal Paper No. 507, May 6, 1942.

[1] Member TAPPI; New York State Experiment Station, Geneva, N. Y.

colonies per gram. A figure as low as this indicates practical freedom from viable microorganisms.

Improvements have also been made in the bacteriological condition of paper containers made from this board. The same is true also of the commonly used types of milk bottle caps, hoods, closures, and of liquid tight containers, widely used in the packaging of many foods. The results of bacteriological studies on these products are reported elsewhere *(1)*.

TABLE I.—BACTERIOLOGICAL ANALYSES OF PAPERBOARD USED FOR MILK CONTAINERS

Colonies per Gram of Disintegrated Paperboard
Media: Old and New Standard Agars
Incubation: 37 deg. C. for 48 hours

No. of mills	Year	Total no. tests	0 and 10	11 and 100	101 and 250	251 and 500	Over 500	Maximum count obtained*
A. Body Stock (Caliper of sheet 0.017 and 0.018 inch) Percentages of counts per gram between								
13	1937-1938	917	16.0	43.0	21.0	10.0	10.0	10,300
6	1939	1,762	39.0	53.6	6.0	1.0	0.4	1,100
8	1940	1,697	50.0	38.0	4.0	1.5	6.5	5,470
5	1941	1,044	73.9	25.0	1.1	0	0	140
B. End Stock (Caliper of sheet 0.024 to 0.030 inch)								
4	1937-1938	147	14.0	74.0	8.0	4.0	0	283
2	1939	579	44.0	55.0	0.8	0.2	0	308
4	1940-1941	530	34.7	53.8	9.8	0.6	1.1	1,100

* Usually this figure is much higher than the next highest count.

The thicker sheets, used for the ends of some containers, have usually yielded somewhat lower counts than body or side wall stock. Differences between low and high caliper boards may be observed among some mills that exercise uniformly good bacteriological control and maintain high quality standards in selection of raw materials. Products from plants that succeed in practically sterilizing their pulps through the use of approved germicides and heat, do not always reveal significant variations.

Table II indicates a general tendency toward lower bacterial counts from thicker boards. However, the situation is frequently so much affected by other factors in mill operations that these differences in counts are not always apparent.

TABLE II.—VARIATIONS IN BACTERIAL COUNTS AMONG BOARDS OF DIFFERENT THICKNESSES

Media: Old and New Standard Agars
Incubation: 37 deg. C. for 48 hours

Mill	Thickness of paperboard, inch	Total no. tests	Percentages of counts per gram between: 0 and 10	11 and 30	31 and 60	61 and 90	91 and 120	121 and 150	151 and 250	251 and 500	Over 500
S	0.017	663	73.0	12.3	6.0	2.8	1.0	2.0	1.7	1.2	0
	0.010	206	60.6	20.0	12.1	5.3	2.0	0	0	0	0
A	0.024	340	40.0	36.4	17.8	2.9	0.6	0.3	1.7	0.3	0
	0.017	832	25.4	25.4	24.2	10.0	5.0	2.0	4.7	3.2	0.1
	0.012	62	1.6	1.6	17.8	11.3	29.0	16.1	14.6	8.0	0
D	0.030	331	48.3	24.8	15.4	9.1	2.1	0	0.3	0	0
V	0.017	552	39.3	21.3	20.0	6.7	3.6	2.2	4.7	2.0	0.2
	0.030	49	8.2	30.6	24.5	30.6	6.1	0	0	0	0
	0.017	86	2.3	12.8	43.0	16.3	15.2	1.1	5.8	3.5	0

In many instances, the relationships indicated in Table II do not obtain because of certain mill practices, methods, and other situations which tend to produce high or very low board counts. Constant effectiveness of chemical reagents in killing or inhibiting the development of microorganisms plays an important part in determining the results secured.

Effect of Mill Operation Procedures on Bacterial Counts

Studies have been made of the reasons for consistently high or uniformly low bacterial counts in pulp, paper, and paperboard. The operations investigated, which cover 50 mills selected at random, include plants manufacturing ground wood pulp, chemical pulps, newsprint, low grade specialties, book and bond, chipboard, wrappers and container board for food packaging. The microorganisms that are responsible for high counts in pulp, paper or paperboard usually come from one or more of the following sources of growth:

1. Raw water supplies.
2. White water system.
3. Starch in dry form or in suspensions or solutions.
4. Fermentable materials used with calender water.
5. Calender water boxes containing decomposable materials.
6. Raw materials used in processes of manufacture.
7. Groundwood stock.
8. Pipelines.
9. Places in a system where stock or white water stagnate, as in pockets, elbows, dead ends, or during storage.

The various sources of growth commonly encountered and their effects are discussed briefly below.

Under conditions of uniformly good microbiological control, bacterial counts in pulp suspensions and paperboard are often reduced to a few types of heat resistant bacteria—mostly common aerobic, spore-bearing rods and micrococci. The following results obtained during 1941 from milk container board produced by four such mills, illustrate the strict control of microbiological growth which these mills maintain. Strict control means that the development of microorganisms is being effectively prevented throughout the entire system.

TABLE III.—MICROBIOLOGICAL CONTROL IN THE MANUFACTURE OF MILK CONTAINER BOARD

Medium: New Standard Agar
Incubation: 37 deg. C. for 48 hours

Mill	Total no. tests	Percentages of counts per gram between: 0 and 10	11 and 100	101 and 250	251 and 500	Over 500	Maximum counts obtained
S	678	89.2	10.8	0	0	0	70
C	197	58.4	39.6	2.0	0	0	130
T	110	28.2	66.3	5.5	0	0	140
Q	529	80.9	18.9	0.2	0	0	130

While such efficient control is feasible, desirable and even necessary for mills equipped for and engaged in the manufacture of paper and paperboard used for the packaging of perishable foods, it is usually sufficient for other plants that find strict control economically impracticable, to prevent colonization and accumulation of growth at focal points that are conducive to the development and spread of objectionable types of microorganisms. The kind and extent of the difficulties which a mill experiences depend upon its success in suppressing these types. In addition, therefore, to the few heat resistant types of bacteria which, as stated above, are ordinarily all that remain under conditions of strict microbiological control, many other species and varieties of microorganisms comprise the usual mill flora. Moreover, intimate knowledge as to the favorite habitat and occurrence of each type, frequently provides clues to its origin.

Contaminated Fibrous Raw Materials

The degree of microbiological control, indicated in Table III, is relatively easy to achieve by mills that bleach their own pulps and utilize water supplies that are bacteriologically satisfactory but more difficult to accomplish in the case of mills that regularly purchase stock from other mills, converting plants, or dealers. Much of the chemical pulp that is obtained from mills that specialize in the manufacture of these grades, is relatively free from microorganisms. A considerable portion of the stock secured from outside sources contains abundant microbiological growth. Some bleached and unbleached chemical pulps yield bacterial counts of many thousand colonies per gram. Such counts, which may run as high as 200,000 and 400,000 colonies per gram, are usually due to the use of process water containing a large number of bacteria. These pulps are sometimes relatively free from bacteria but may contain many mold spores and even

discoloration or spotting caused by the growth of these organisms.

Ground wood is rich in food substances available to bacteria, yeast-like fungi and molds. Hence, the problems of controlling the growth of microorganisms in ground wood pulp and preventing fermentation processes from taking place, are unusually difficult. Some mills that manufacture groundwood are successful in substantially reducing bacterial counts throughout the entire system, while others not only fail to do so, but transfer to other mills that purchase this pulp, the microbiological growths that develop. Bacterial counts in groundwood lap stock are frequently unusually high but, under proper conditions of chemical treatment and handling, reasonably low counts in this pulp can be maintained. Many mills are today making paper and paperboard of suitable quality, with a high groundwood content, used for food wrappers, containers and packages. Many of the typical groundwood species are among the forms that are, in general, most readily killed by heat.

Certain kinds of secondary stock contain a miscellaneous microbiological flora that varies widely in the total number of organisms present. Samples of old news often vary from a few hundred to 2000 colonies per gram, while mixed waste papers sometimes yield counts of 50,000 to 300,000 colonies per gram.

In cases where fibrous raw materials contain an abundance of microbiological growth, it is necessary to employ germicidal treatments at beaters or beater chests. While, in this way, the number of organisms present in pulp systems can be reduced and their development prevented, it is sometimes impracticable, particularly in the manufacture of chipboard, to establish strict microbiological control. Some chipboard mills are so situated that fairly effective microbiological control can be achieved. It is possible and most desirable for all mills to prevent objectionable contamination of fibrous materials obtained from plants that are in a position to cooperate by employing preventive and sanitary procedures. When microbiological development in pulps utilized by a mill is due to its own carelessness in handling or storage, the situation can usually be more readily remedied.

Raw Water

In spite of the fact that the majority of the mill systems studied use methods of purification for river, canal, creek, and similar supplies, organisms characteristic of raw and polluted water are frequently introduced into stock systems. This situation is usually due to one or more of the following causes:

1. Inefficiency of filtration; sand filters, or other types.
2. Inadequate chlorine or chloramine treatments.
3. Intermittent discontinuance or reduction of chlorine or chloramine treatments.
4. Treatment of only a part of the raw water supply used by a mill.
5. Failure to utilize bacteria-killing treatments so that they are in effective operation when a mill starts up.

Bacterial counts obtained from river water vary from 200 or 300 colonies to 100,000 colonies per c.c. In two instances counts in excess of this maximum were obtained. Approximately one third of the raw water sources utilized by the mills investigated usually yield counts of over 10,000 colonies per c.c. In spite of the precautions taken to purify fresh water supplies, about sixty per cent of the mills studied, allowed appreciable raw water contamination to enter the mill system.

The majority of the mills that report difficulty in securing satisfactory bacterial counts in finished paper and paperboard either neglect to maintain constant supervision and consistent treatments of raw water supplies or overlook the fact that relatively few aggressive, slime-producing microorganisms in fresh water, are capable of multiplying and colonizing in mill systems. Situations such as this tend to nullify the beneficial effect of the other treatments utilized.

Calender Water

The importance of the bacteriological content of calender water to paper and paperboard counts is obvious. In spite of the precautions taken by many mills to provide suitable water for this purpose, such as from wells, springs, city supplies, etc., the condition of this water has been generally neglected. Calender water boxes should be kept clean and not allowed to develop slime. Damming materials are sometimes allowed to ferment, producing undesirable odors. Water boxes often contain dirt, fiber, oily residues and waste. The use of contaminated and fermentable solutions or emulsions at water boxes, such as starch or soapy waxes, is a direct cause of unusually high counts in paper and paperboard. A few mills take whatever precautions may be necessary to maintain low bacterial counts in all calender water utilized. The majority are partly successful in this but fail to properly control the development of microorganisms in all of the calender water boxes used. In many instances bacterial counts vary from several hundred to many thousand colonies per ml. When starch solutions are used the counts obtained are unusually high, varying from about 10,000 to 500,000 colonies per ml. Here again, some mills maintain low counts in their starch suspensions and solutions. Several mills that normally produce paperboard of low bacterial content—i. e., less than 250 colonies per gram—have experienced considerable difficulty in meeting this standard due to the development of high bacterial counts in calender water or solutions. The following data are illustrative of one such instance.

TABLE IV.—INFLUENCE OF HIGH BACTERIAL COUNTS IN CALENDERING SOLUTIONS UPON PAPERBOARD COUNTS

Media: Old and New Standard Agars
Incubation: 37 deg. C. for 48 hours

Bacterial count of calendering solution per cc.	No. tests of paperboard	Percentages of counts per gram between 0 and 100	101 and 250	251 and 500	501 and 1,000	1,001 and 2,000	2,001 and 5,000	5,001 and 10,000	Over 10,000	Max. count
Over 20,000	135	18.5	11.1	18.0	28.1	15.5	3.0	5.1	0.7	10,300

In purchasing starch, many mills specify a product of low bacterial content such as chlorinated or food grades of starch. Bacteriological analyses of the ordinary dry starches used, sometimes yield counts of between 2,500 and 26,000 colonies per gram.

Pipelines and Stagnation of White Water and Stock

In some instances the troubles which mills encounter have their origin in the condition of pipelines. The situation is often accompanied by difficulties involving stagnation of white water or stock in relatively inaccessible places, dead ends, pockets, elbows, and during storage. Bacteria develop which produce

objectionable odors and form products that are deleterious to efficient operation and high quality paper and paperboard.

Re-used White Water

Storage and handling of recirculated white water produce conditions that frequently result in distribution of microbiological growths throughout the mill. If process water is reused without storage, and is chemically treated to remove microorganisms, these supplies are usually satisfactory. Main storage chests or tanks are, however, common sources of abundant microbiological development. White water picks up growths as it passes through pipe lines and other parts of a mill system, sometimes consisting of resistant types of microorganisms which persist and finally appear in finished products. Fresh stock receives abundant contamination from such water, initiating or aggravating troubles that often prove serious. If white water containing starch is used in mill processes, the reused water becomes an even greater hazard to satisfactory operation and efficient microbiological control. This water, as well as broke stock containing starch, should receive proper chemical treatment in order to avoid trouble when white water and stock pass through pipe lines and into the

TABLE V.—INFLUENCES OF VARIOUS SOURCES OF BACTERIOLOGICAL GROWTH ON COUNTS OF PAPER OR PAPERBOARD

Media: Old and New Standard Agars. Coliform and Special Media
Incubation: 37 deg. C. for 48 hours or 28 to 30 deg. C. for 3 to 5 days

	Average Bacterial Counts Normally Obtained				Effects of Increase in Microbiological Growth				
							Average Bacterial Counts		
Mill	Fresh water as used col. per cc.	Re-used white water col. per cc.	Stock at machines col. per cc.	Finished paper or paperboard col. per gram	Sources of samples	Col. per cc.	In stock system	Per gram of finished paper or paperboard	Evidences of inferior quality in finished products
B	75	15	43	74	Solutions used at calender water boxes	27,200 88,000	.....	1,150	.....
D	19	1,200	2,200	30	Stock going to machines	10,000	Do	87	.....
T	2	Source (a) 20 Source (b) 300	3 77	31	Groundwood stock	460,000 per gm.	13,850	637	.....
					Calender water	3,325			
F	50	5	320	98	Stock going to machines	Source (a) 7,500 Source (b) 25,600	Do	460	.....
					Groundwood white water	280,000			
C	9	....	1,100	50	Stock going to machines	8,300	Do	181	.....
W	5	243,000	230,000	522	White water from filters	4,780,000	1,160,000	2,000	Slime spots
X	48	60	70	40	Starch solution at size press	11 520	.....	166	.....
E	10	68	580	164	Calender water	5,730	.....	660	... ...
S	2	750	270	Less than 15	Suction box white water	9,300	3,150	150	.....
					White water showers	7,000			
Y	0	62,000	64,000	122	Machine white water chest	2,250,000	710,000	.....	Slime spots
Z	0 to 14	17	345	84	Filler stock	5,000,000	Source (a) 7,000 Source (b) 79,000	14,500	.....
U	1	Source (a) 480 Source (b) 24,200	1,100	1,640	Dry starch	21,500 per gm.	3,850,000	.....	Objectionable odors
					Re-used white water	Source (a) 4,000,000 Source (b) 2,800,000			
L	5		5,000 1,000 to 93,500	....	Stock from main pipe lines	4,820,000	Source (a) 280,000 Source (b) 4,750,000 Source (c) 410,000	.....	Slime spots and odor
M	8	Source (a) 250,000 Source (b) 328,000 Source (c) 387,000	Source (a) 212,800 Source (b) 267,000 Source (c) 395,000	....	White water system	5,760,000	Source (a) 2,000,000 Source (b) 2,300,000	.....	Slime spots
I	13	Source (a) 330,000 Source (b) 260,000 Source (c) 321,300	Groundwood stock 280,000 Sulphite stock 96	....	Groundwood system	Source (a) 3,435,000 Source (b) 2,510,000	Groundwood stock 2,200,000 Sulphite stock 2,600	.....	Objectionable odors

mill system. Ground wood white water is an unusually prolific source of microbiological growth and, unless properly handled, presents some difficult problems.

Table V shows the bacterial counts ordinarily obtained from certain mills and the results that have been secured when microorganisms are allowed to develop at various places in these plants. In some cases the only result noted is an increase in the bacteriological counts obtained from the finished paper or paperboard. In other instances, where counts are less significant than the visible evidences of inferior quality in these products, microbiological troubles due to spotting or objectionable odors are indicated.

It is obviously impossible in a brief discussion to consider all of the focal points of microbiological growth found in mill systems. The experiences of many mills show, however, that through careful and critical investigation, all important sources of growth can be determined and eliminated. Such investigations, usually called microbiological surveys, reveal all such focal points and show the means through which distribution and spread of microorganisms take place.

The various factors which influence the survival of microorganisms in pulp, paper, and paperboard under the lethal effects of heat and chemicals employed by mills, are not well understood. It is true that, as the methods used by mills to eliminate microorganisms increase in effectiveness, the flora that remains tends to become restricted to a relatively few heat resistant species and varieties of bacteria. It has been found, however, that where microbiological growths in mill systems are allowed to develop abundantly, a considerable number of miscellaneous types of organisms are able to withstand chemical reagents and even the effects of machine driers. We have evidence as to the ability of such a flora to persist in pulp suspensions during prolonged exposure to the high temperatures maintained in hot pulp systems—i.e., 65.5 deg. C. (150 deg. F.) to 82.2 deg. C. (180 deg. F.), and also in the finished paperboard produced, which sometimes yields bacterial counts that are between 200,000 and 300,000 colonies per gram.

Under certain conditions, microbiological analyses of paper or paperboard may yield considerable information as to the effectiveness of the control measures utilized by these mills. While the laboratory methods now available for testing finished products, are not, in themselves, sufficiently critical to provide all of the essential information in pulp and paper microbiology and plant sanitation, such procedures are helpful in determining, in a general way, the condition of these products and the precautions taken in their manufacture. The following table shows the results obtained from bacteriological analyses of various types of paper and paperboard products.

Generally speaking, nearly all of the groups of microorganisms that are found in mill systems have also been isolated from paper and paperboard of various grades. Microorganisms that are normally considered susceptible to the action of heat and chemicals, are often able to persist in paper and paperboard products. There is evidence that, under certain conditions, a protective action may be exerted upon microorganisms in pulp systems. A number of interrelated factors seem to influence this action some of which have, thus far, been inadequately demonstrated.

For example, the rate of heat transfer is undoubtedly influenced by the physico-chemical conditions of the pulp suspension, mass, or web. These may include the effects of agitation, moisture content, compactness, hydrogen ion concentration of the substrate, and gelatinous or viscous condition of the stock due to slime masses and to the amount of colloidal material present. In hot pulp systems the influence of certain of these factors has been noted though not all of them are known to have a direct connection with the bacterial content of the finished sheet. The presence of slime masses in the stock is sometimes a direct cause of high counts in paper and paperboard as well as susceptibility or resistance which the microorganisms themselves exhibit toward the action of heat and chemicals. There is also some basis for the belief that the effect of biological factors, such as the intimate associations that exist among microorganisms, may explain, to some extent, an indirect "protective action". The protection afforded miscellaneous groups of microorganisms that are embedded in slime masses produced by other types of organisms is a form of mechanical association that is frequently encountered. Another factor which is of undoubted importance in determining the bacterial counts obtained in finished products may be found in the widely variable physical and operative conditions that obtain among mills with respect to drying. These relationships have not, however, been completely established.

This brief discussion emphasizes the weaknesses and inadequacies of present knowledge of the basically important physical, chemical, and biological factors involved in proper interpretation and understanding of microbiological results. It is obvious that much remains to be accomplished in the study of pulp, paper, and paperboard microbiology. Until an adequate research background in this subject has been achieved, comparable with other industries, it would be unwise to make sweeping assertions or to draw premature conclusions concerning the role of microorganisms in mill systems and operations.

Literature Cited

1. *Modern Packaging* 14:46 (1941); *J. Milk Tech.* 4:63 (1941).

TABLE VI.—BACTERIOLOGICAL ANALYSES OF PAPER AND PAPERBOARD PRODUCTS

Media: Old and New Standard Agars.
Incubation: 37 deg. C. for 48 hours

Classes of products Paper or paperboard for	No. of plants	Total no. tests	Percentages of counts per gram between									
			0 and 100	101 and 500	501 and 1,000	1,001 and 5,000	5,001 and 10,000	10,001 and 50,000	50,001 and 100,000	100,001 and 200,000	200,001 and 500,000	500,001 and 1,000,000
Milk bottle caps, hoods, and closures	12	1,856	93.30	5.61	0.65	0.38	0	0.06	0	0	0	0
Milk containers	24	7,153	88.00	9.00	1.44	1.42	0.13	0.01	0	0	0	0
Liquid tight containers	10	501	86.20	13.80	0	0	0	0	0	0	0	0
Food wrappers	6	242	65.30	31.80	1.70	0.40	0	0.40	0.40	0	0	0
Other types of food containers; trays, pails, cups, etc.	13	201	59.20	16.90	17.40	6.50	0	0	0	0	0	0
Bulk filler cans	6	1,115	54.00	32.10	6.60	5.70	0	1.60	0	0	0	0
Tubing	8	166	44.00	28.30	17.50	10.20	0	0	0	0	0	0
Miscellaneous uses	14	321	10.30	13.40	6.20	12.80	3.10	18.40	10.90	9.00	14.30	1.60

IMPORTS OF PAPER

NEW YORK IMPORTS

WEEK ENDING OCTOBER 3, 1942

SUMMARY

Newsprint .....614 rolls

NEWSPRINT

——, ——, ——, 327 rolls.
——, ——, ——, 287 rolls.

BONES

Rogers & Hubbard, ——, ——, 1686 bags.

Union Bag Changes

"For the past year the war has placed a double burden upon the administration of the company's sales, says Alexander Calder, president of the Union Bag and Paper Corporation. We have been faced with the dual problem of conversion to war products and the maintenance of essential civilian production. The obligations and the opportunities involved in both fields of endeavor, and the great increase in administrative detail, are so pressing that we have decided to divide the responsibility for company sales.

"Effective immediately, George B. Gibson will devote his entire time to the direction of all Union sales except grocers bags, variety bags and market paper. As vice president in charge of sales of pulp, board, special (made-to-order) bags, including the entire packaging field and multiwall bags, and all miscellaneous products, Mr. Gibson will give particular attention to the study of products with which this company and its customers can serve the war needs of the Government.

"H. S. Daniels will immediately assume the responsibilities of vice president in charge of sales of grocers and variety bags, and market paper.

"Both of these men are too well-known in the industry to require any introduction or comment. We feel that this move will enable our sales administration to give the necessary time and attention to all of the problems which we and our customers—including the Government, now face in our many product lines.

"The distribution of our many products under a war economy is a matter of such vital importance that I, myself, plan to cooperate closely with both Mr. Gibson and Mr. Daniels in the administration of our sales program. This will, of course, keep me in close touch with your individual, current problems."

War Economy of Package Building

Wilbur F. Howell, secretary of Robert Gair Company, Inc., New York, was the speaker at the Rotary Club of Staten Island on September 8, at the Meurot Club, St. George, S. I. His subject was "The War Economy of Package Building." He stressed the necessity of the substitution of paper board for more critical materials, the use of paper board packaging for new products, such as dehydrated foods, eggs and milk and the large quantities of packaging used by the Government in the war effort. He said: "In our whole system of modern merchandising, selling and advertising, the package is the keystone which is not likely to be dislodged. The package assures us of standards of quality, correct weights, cleanliness, identification and convenience, and so, in my opinion, any commodities which are allotted for civilian use in this war effort will continue to be adequately, economically and simply packaged. We can look forward with confidence to the stability of this industry, first, because it is essential both to the war effort and to civilian needs, and secondly, because its basic raw material is a by-product readily obtainable in Metropolitan areas."

Ed. Bonner Joins Navy

Arthur Chamberlain, executive secretary of the National Paper Trade Association, New York, writes:

"Most of our members have come to know and appreciate E. J. Bonner, who came with us as office boy ten years ago and has steadily risen in capacity and usefulness until we all recognized him as a valued member of the staff. You will therefore realize and share our loss due to his enlistment in the Naval branch of the Service.

"His intelligent and conscientious work, coupled with the experience and acquaintance that he has gained, made him invaluable to us. It will be a problem to fill his place and provide for the work that he has done. Ed was practically the Manager of our Convention Exhibits and will be especially missed by the manufacturers who participated and who depended on him for all kinds of service and assistance.

"He leaves—temporarily, we hope—with our high regard and our earnest wishes for his welfare and happiness."

Payroll Deduction Plan Wins Favor

FULTON, N. Y., October 3, 1942—Paper mills in this section are taking an active part in purchasing war bonds and stamps under the payroll deduction plan. A meeting was held this week at the plant of the Oswego Falls Sealright Company which was attended by thirty union officers and shop stewards. John Lincoln, president of the organization, presided and the payroll deduction plan was explained in detail. The plan was received and accepted with great enthusiasm by the gathering and an immediate campaign is planned to secure the full cooperation of all employees. Among those at the meeting were C. C. Camenga, deputy state administrator, and Edward Skinner, of New York, who are assisting the treasury department in informing employees of plants about the payroll deduction plan. Other plants visited where the plan has already started include the Volney Felt Mills and the North End Paper Company.

Portugal to Manufacture Paper

The manufacture of paper and pulp will be established in Portugal, according to an announcement of the Minister of Economy reported by "Agencia Helice," Lisbon. Authorization has been given to the society, "Companhia Portuguesa de Celulose," to install the necessary equipment for the production of bleached and unbleached pulp, newsprint, printing and writing papers. The conditions require that the mill be in operation within two years.

Under the conditions enumerated by the government the project must be entirely Portuguese owned and managed. The quantity of paper manufactured must be sufficient for the entire requirements of the country and the surplus may be exported. During the duration of the war the following minimum prices per ton have been specified: bleached cellulose, $64; unbleached cellulose. $52; mechanic paste, $28; and newsprint paper, $52.

New York Paper and Pulp Market Review

Trade Demand For Major Grades of Paper Is Slightly Improved This Week—Cut In Future Pulp Supply Is Expected Under WPB Plan of Concentration of All Industries — Paper Stock Is Slow.

Office of the PAPER TRADE JOURNAL.
Wednesday, October 7, 1942.

Sales in some major grades of paper are moderately good, with the reflection of uncertainty for the future course of trade, in some of the reports received from many manufacturers' representatives, jobbers, and general paper merchants this week.

The average volume of current sales appears approximately 19% under the relatively high volume during the corresponding date last year. The prospect of a gradual decline in consumption and production in many grades of paper has been and continues to be expected in some well informed quarters. Diversion of manpower to war work, curtailment and restriction of normal business and a more concentrated effort by the Administration to win the war, must inevitably curb civilian trade, spending and normal activity. The supply of labor is viewed in some quarters as likely to develop into a most important factor in the future.

Paper production for the week ended September 9 was estimated at 87.5%, compared with 105.9% for 1941, with 89.2% for 1940, with 95.7% for 1939, and with 81.1% for the corresponding week for 1938.

Paper board production for the week ended September 26 was 78.0%, compared with 98.0% for 1941, with 78.0% for 1940, with 82.0% for 1939, and with 69.0% for the corresponding week for 1938.

Wood Pulp

The report that more Canadian chemical wood pulp is going into the production of cellulose for nitrating purposes, is interpreted in some quarters to indicate less utilization of pulp for paper making. This curtailment is in line with the voluntary restriction by producers in the Northwest. The WPB is reported preparing plans for the concentration of the pulp industry, to relieve the labor supply shortage, and to increase the production of lumber now urgently needed for the war effort. It is pointed out, however, that as the war effort seems certain to curtail civilian demand further in the future, less paper will be required to satisfy civilian requirements.

Rags

Mill buying of roofing rags is active, with ceiling prices firmly maintained under the steady demand. Fair demand is reported in a limited number of the higher grades. Prices are unchanged.

Old Rope and Bagging

Mill buying of No. 1 old Minila rope is steady and takes about all available supplies of this grade. Jute strings and sisal threads are active. Prices firm.

Supplies of scrap bagging are reported very limited but trading is slow. The substitution of paper and cotton bags and sacks for new burlap bags, is cited as the reason for lack of activity in old bagging.

Old Waste Paper

Mill buying of paper stock is currently reported on a limited scale. Reports indicate that mill inventories are ample, and not much improvement in this market is expected in the near future. Prices are generally of a nominal character, and well below ceiling prices. Sales of No. 1 mixed papers at from .30 to .35 per cwt. have been reported this week.

Twine

Government requirements for twine and cordage represents a good volume. Normal trade demand is moderate in many standard grades. No important change in prices has been reported during the week.

Pricing Paper Products

WASHINGTON, D. C., October 7—Additional formulas are provided manufacturers of converted paper products for pricing new, specialty and off-standard items which they could not price under the regulation for industrial and converted paper products, (Maximum Price Regulation No. 129).

Today's action by the OPA, taken in Amendment No. 8 to Maximum Price Regulation No. 129, becomes effective October 13, and affects specialties and items which in one or more characteristics deviates from standard items covered by the regulation.

Under the regulation manufacturers were unable or found it difficult to price items which they did not sell or offer during the specified base period of October 1-15, 1941 for some of the products and December 1-15, 1941 for others.

A procedure is now set forth for pricing items varying only in type or size of package, count, length, quantity or basis-weight from items sold during the base period. A proportionate increase or decrease in price, depending upon the change from the comparable item sold during the base period, can be made.

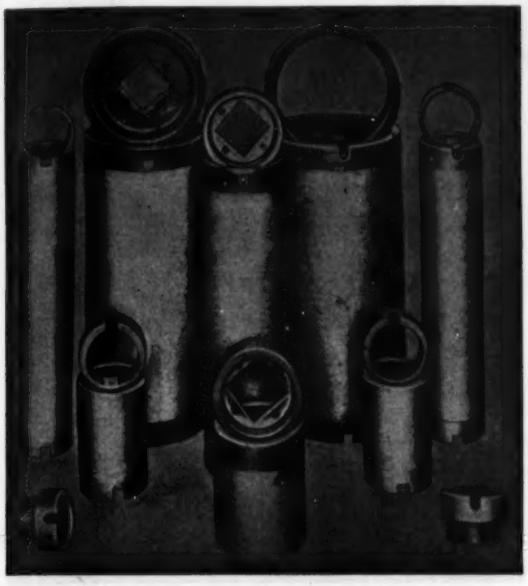
For example, under this formula a manufacturer who has reduced by one-fourth the length of a roll of wax paper he sold during the base period shall establish a maximum price for the shortened roll reflecting a 25 percent decrease. Similarly, a 25 percent increase in the price of paper napkins may be charged if the manufacturer has increased the number (or count) of paper napkins in a package from 100 to 125.

The formula for the pricing of specialty items requires manufacturers to compute raw material costs, conversion charges, margins and charges for delivery on the same basis as he used during the base period.

In the case of manufacturers' sales for $10,000 or more or involving a commodity which cannot be priced by the methods prescribed in the amendment or the regulation, the manufacturers must apply to the OPA, Washington, D C., for authorization of a method to determine his maximum price.

His application shall set forth:

(1) a detailed description of the commodity, (2) a statement showing the differences between the commodity to be priced and the other commodities sold or offered during the base period, and (3) comparative cost sheets for the item and the nearest comparable items sold or offered during the base period with special attention to data on raw materials cost, conversion charges and margin.



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Special features of the revised edition include:—new methods of wood preparation peculiar to the Pacific Coast and the South; new cooking processes, modifications of the sulphite process, forced circulation, etc.; new developments in recovery processes; improvements in paper machine design, and criticism of these developments based on the author's own experience; recent improvements in ground-wood manufacture; automatic control; new types of equipment—refiners, screens, thickeners, special bleaching equipment, continuous rotary filters and other things new to the industry since the publicaion of his first book; thorough checking and modernization of all figures as to power consumption, capacity, etc.; and great attention to new acid-resisting materials such as Monel metal, stainless steel, chromium plate, rubber linings, etc.

An entire chapter has been added on converting and coating; the chapter on the finishing room has been greatly amplified based on the author's activities in his later years. There is much added material on tissues, glassine, boards and other specialties. The chapter on bleaching has been greatly enlarged and amply covers modern practice. At the same time all the notable features of the original book have been conserved and strengthened.

CONTENTS

Historical Note • Processes by Which Pulp Is Produced • Materials from Which Pulp Is Produced • Varieties of Paper • The Saw Mill • The Wood Room • The Sulphite Mill • The Acid Plant • The Alkaline Processes • The Groundwood Mill • Screening and Refining of Pulp • Bleaching • The Beater Room • The Machine Room • The Finishing Room • Converting and Coating • Paper Defects: Their Cause and Cure • General Design of Pulp and Paper Plants • Personnel and Records • The Power Plant • Paper Testing: Index.

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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL.
Wednesday, October 7, 1942.

BLANC FIXE—Quotations on blanc fixe are firm and continue unchanged at prevailing market levels. The pulp is currently quoted at $40 per ton in barrels, at works; the powder is offered at $60 per ton, f.o.b., works. Demand reported fair for the week.

BLEACHING POWDER—Prices on bleaching powder are firm. Supply under allocation control. Bleaching powder is currently quoted at $2.25 per 100 pounds, in drums, at works.

CASEIN—Quotations on casein are unchanged for the week. Standard domestic casein, 20-30 mesh, is quoted at 19 cents per pound; 80-100 mesh at 19½ cents per pound; all prices in bags, car lots. Argentine casein, 20-30 mesh, at 7½ cents per pound, c.i.f., is reported nominal. No quotations on French casein.

CAUSTIC SODA—Prices of caustic soda are reported unchanged. Supplies ample. Demand fair for the current week. Solid caustic soda is currently quoted at $2.30 per 100 pounds, flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged. Demand reported fair for the current week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Quotations on chlorine unchanged. Government demand for war use continues heavy. Chlorine is currently quoted at from $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—Quotations on some grades of rosin are higher for the current week. "G" gum rosin is currently quoted at $3.48 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $3.48 per 100 pounds, in barrels, New York. Seventy per cent gum rosin size is quoted at $3.68 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand reported light for the current week. Domestic salt cake is currently quoted at $15 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point. Quotations on imported salt cake are nominal at $16 per ton.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Demand moderate. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch continue unchanged for the current week. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Demand reported fair. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at from $1.75 to $1.85 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices of sulphur are firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $16 to $21 per ton, at mills. No quotations on imported talc.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	$5.00	@	—
No. 1 Wrapping	4.75	"	—
Standard Wrapping	4.50	"	—
Standard Bag	4.125	"	—
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.05	"	—
White No. 1½	1.00	"	—
White No. 2	1.00	"	—
Anti-Tarnish M. G.	.95	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.35	"	—
Bleached, Jr.	2.65	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	5.50	"	5.75
No. 2 Manila Wrapping, 35 lb.	5.25	"	5.50
Boards, per ton—			
News	*48.00	@	—
Chip	*45.00	"	—
Sgl. Mla. Lt. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*60.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$40.25@$47.25	$41.40@$48.50
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	32.20 " 37.75
75% Rag	24.75 " 29.00	25.90 " 30.50
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper.

Delivered in Zone 1

No. 1 Glossy Coated	$13.65	@	$15.00
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	13.25
No. 4 Glossy Coated	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.75
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. & S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. & S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C.	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight to Destination.

Bl. Softwood Sulphite	$76.00
Unbl. Softwood Sulphite	64.00@66.00
Bl. Hardwood Sulphite	73.50
Unbl. Hardwood Sulphite	63.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich	72.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi-Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	66.00
Unbl. Soda	62.00
Groundwood	46.00

Transportation Allowances Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum price.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	8.00	@	8.25
Silesias No. 1	4.50	"	4.75
New Unbleached	8.00	"	8.25
Blue Overall	5.75	"	6.00
Fancy	3.00	"	3.25
Washables	2.50	"	2.75
Mixed Khaki Cuttings	2.50	"	2.75
O. D. Khaki Cuttings	3.00	"	3.15

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Norman Chip Duster
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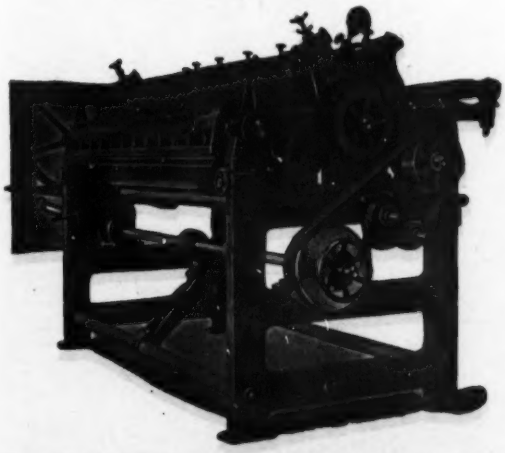

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BUT also a guarantee by men who for 78 years have prided themselves in making finer felts. TO YOU --this is the mark of dependability, longer felt life and greater saving.

KNOX WOOLEN CO.
CAMDEN, MAINE.

Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

OPA Maximum Prices.

Foreign Rags

All prices nominal

New Rags			
New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25
Old Rags			
No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.00	@	4.25
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	4.75
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	4.25	"	4.75
Sisal Strings	3.25	"	3.75
Mixed Strings	1.10	"	1.20

*OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
Mixed Books	1.07½	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	1.75	"	—
Old Corrugated Containers	1.00	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17¼	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—
(Hard Fiber)			
Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1	.07¼	@	.07½
New White No. 2	.04½	"	.05
Light Silesias	.04½	"	.04¾
Silesias, No. 1	.04	"	.04¼
Black Silesias, soft	.03¾	"	.04
New Unbleached	.07¼	"	.07½
Washable Prints	.03¾	"	.03½
Washable No. 1	.02	"	.02¾
Blue Overall	.04½	"	.05½
Cottons—According to grades—			
Washable shredding	—	"	.01¾
Fancy Percales	.03¼	"	.03½
New Black Soft	.02¾	"	.03
New Dark Seconds	1.75	"	2.00
Khaki Cuttings—			
No. 1 O. D.	.03	"	.03¼
No. 2 Mixed	.02¼	"	.02½
Corduroy	.01¾	"	.02¼
New Canvas	.04¾	"	.05¼
New Black Mixed	—	"	.02½

Domestic Rags (Old)

White No. 1—Repacked	3.80	"	—
White No. 2—Repacked	2.90	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
Sisal Rope	3.75	"	—
Mixed Rope	.75	"	1.00
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Box Board Cuttings	.72½	"	—
Jute Corrugated Cuttings	.90	"	—
Overissue News	.85	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old Corrugated Containers	1.00	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	4.00	@	4.25
Sisal Rope	4.50	"	4.75
Mixed Rope	1.35	"	1.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.00	"	3.50
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	4.00	"	4.25
Scrap Sisal	4.50	"	4.75
Scrap Sisal for Shredding	4.75	"	5.00
Wool Tares—			
Foreign	(nominal)		
Domestic	5.00	"	5.75
Aust. Wool Pouches	5.00	"	5.25
New Burlap Cuttings	5.00	"	5.25
Heavy Baling Bagging	4.25	"	5.75
Paper Mill Bagging	2.75	"	3.25
No. 2 Bagging	1.35	"	—

*OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¼	"	.05
New White No. 1	.06½	"	.07
New Light Flannelettes	.06	"	.06¼
Canton Flannel, Bleached	.06¼	"	.07
Underwear Cutters, Bleached	.06	"	.06½
Underwear Cutters, Unbleached	.06	"	.06½
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03¾	"	.04
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.07	"	.07¼
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.03½	"	.03¾
O. D. Khaki	.04	"	.04¼
Corduroy	.03½	"	.03¾
New Canvas	.07	"	.07¼
B. V. D. Cuttings	.06½	"	.07

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

*OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices.

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.50	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 2 Roofing Rags	1.45	"	—